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AUTOMOTIVE INDUSTRIES

VOLUME 63 OCTOBER 4, 1930 NUMBER 14

Dealers' Position is Strengthened By Aggressive Maintenance Program

Considerable improvement is expected during closing period of the year as compared with previous three months + + + +

By Leslie Peat

1 AUTOMOBILE DEALERS generally expect business during the fourth quarter will show improvement over retail sales during the last quarter of 1929.

2 AGGRESSIVE MERCHANDISING of MAINTENANCE, in many cases the addition of mechanics to dealer payrolls, has been responsible for keeping a large number of them in business during the past 12 months.

3 DESPITE PRESENT LOW LEVELS OF WHEAT, the marketing outlook for crops is generally good, especially in the Middle Western, Southern and South Western states.

4 BUSINESS SENTIMENT IS IMPROVING in most sections of the country, rural and industrial.

THESE conclusions briefly sum up the reports received this week from *Automotive Industries* correspondents in the major marketing centers of the country, who were asked to interview dealers, dealer as-

sociation executives and bankers on the fourth-quarter outlook.

The present depression of the stock market will be felt in the larger metropolitan areas, but rural distribution points have been slow to reflect previous Wall Street bear reactions.

In all probability, effects of the present securities market depression will not be felt in most sections of the country unless it assumes such proportions as to make it front-page news throughout the land.

Employment has shown considerable improvement, with the exception of industrial centers along the Eastern seaboard, during the last part of August and in September. This has contributed to the sharp increase of bank deposits, making it possible for added expenditures during the next quarter.

Dealers are looking forward with more than usual interest to new model announcements by their factories. They agree that business is generally on a foundation firm enough to reflect increased new car sales.

Fairly early this year dealers saw that it was necessary to promote the merchandising of maintenance. Our correspondents reported that many of them added to their facilities, increased the number of their mechanics and advertised locally to bring in a larger volume of repair work.

The steady increase in gasoline consumption this year bears out the theory that automobiles have covered a greater mileage than ever before. Unquestionably, more used cars have been run this year than ever before. That means that the total repair and overhaul bill has been larger than heretofore.

Devastation of the drought on rural purchasing power does not seem to have been as serious as first estimates indicated. Counties suffering the most were, in most cases, bounded by counties which suffered very little.

The Mississippi and Ohio river valleys suffered most from the summer's dry spell. This is shown in the accompanying map of the feed situation, as of Aug. 20. Immediate effects of the drought were not as serious as the resulting feed situation in the larger area, extending from the Great Lakes southwest toward the Gulf of Mexico.

Reports covering the six New England states indicate a better feeling among dealers than they had two or three months ago. The rural population is ahead of the industrial groups, however. Factories generally had built up large surpluses, with the result that they were hard hit when the purchasing throughout the country slumped.

Tourists, taking advantage of tourist camps, have spent a considerable sum in these states, although hotels and established tourist resorts got little of it.

New Jersey reported an active summer in tourist trade, a large factor in that state's total income. Industries in New York and Pennsylvania are still running at low levels, and coal mining is off because of the long warm spell.

Crop prospects, especially in New Jersey and New York, are good, but Pennsylvania reports the outlook is still far from bright.

Crops in Ohio, Indiana, Illinois and Michigan are generally under the Department of Commerce 10-year average, and because of the large industrial population in this section, buying power has been curtailed further because of non-employment.

Detroit, particularly, has suffered. This area suffered the slump of automobile production first. Parts plants worked on greatly reduced schedules or closed down entirely for a considerable period.

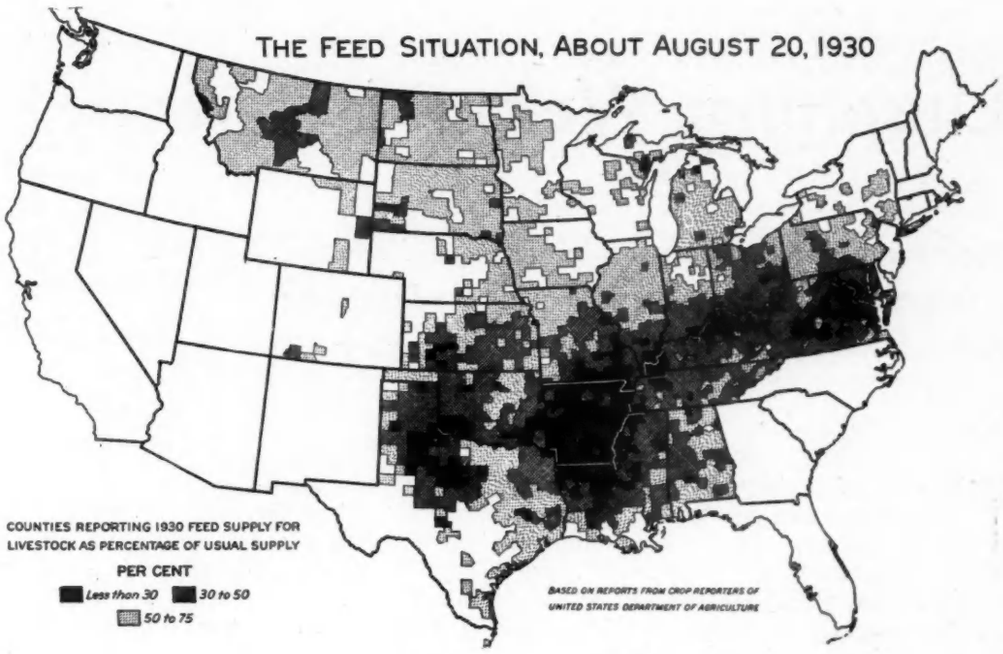
However, it must be borne in mind that retail sales around Detroit respond quickly to any gain in employment in the automobile factories themselves. The depreciation of 1921 was followed here by a surprising spurt in sales just after the automobile show in 1922, when the factories generally in-

Final Quarter Outlook and Reports of Dealer Business

City	Used Car Stocks as Compared With Same Time, 1929	Repossessions as Compared With Same Time, 1929	Outlook for Fourth Quarter	Third Quarter, 1930, New Car Sales as Compared With Third Quarter, 1929	9 Mos., 1930, New Car Sales as Compared With Same Period, 1929
New York	higher	same	fair	off 50%	off 42%
Boston	same	fewer	good	off 40%	off 38%
Springfield	same	fewer	fair	off 35%	off 30%
Philadelphia	higher	same	fair	off 34%	off 26%
Baltimore	same	same	fair	off 35%	off 10%
Pittsburgh	same	fewer	good	off 36%	off 12%
Akron	higher	more	poor	off 37%	off 50%
Cleveland	higher	more	poor	off 45%	off 30%
Columbus	same	same	fair	off 55%	off 35%
Cincinnati	higher	more	poor	off 35%	off 25%
Louisville	same	same	fair	off 40%	off 50%
Toledo	higher	more	fair	off 50%	off 60%
Detroit	smaller	same	poor	off 65%	off 45%
Chicago	smaller	same	fair	off 50%	off 25%
Milwaukee	smaller	same	good	off 35%	off 25%
Minneapolis	smaller	same	good	off 30%	off 25%
St. Louis	smaller	same	good	off 40%	off 20%
Kansas City	smaller	same	good	off 38%	off 25%
Denver	larger	more	fair	off 40%	off 35%
Dallas	heavier	same	good	off 45%	off 30%
San Francisco	smaller	fewer	fair	off 50%	off 28%
Oakland	same	same	fair	off 45%	off 25%
Seattle	higher	more	good	off 40%	off 25%
Los Angeles	larger	more	poor	off 40%	off 30%
New Orleans	larger	more	fair	off 45%	off 30%

Rural purchasing power was hit by drought and dearth of feed supplies

Report of sales showed positive relation to long summer dry period



creased production, and there are those who think that such a spurt in the early months of next year is not entirely out of the question.

Tire companies in the Akron area are still working on reduced schedules, and Cleveland's industrial picture has few bright spots. Building is at very low levels. Toledo manufacturing is off. A large part of this city's manufactured output goes into automobiles and trucks, and the low ebb of production has had a marked effect.

As will be seen from the legends on the map, except for the southern Mississippi areas, most of the remaining states in the Union show brighter prospects. They suffered the least from the drought, and Wisconsin, Minnesota, Iowa, Kansas, Nebraska and parts of Missouri report good crop outlook.

Texas and Oklahoma report bright prospects in the rural areas, and with curtailed oil production and the possibility of higher crude petroleum prices, retail sales will be much better, it is predicted.

Dealers and finance companies, reports show, have been lenient this summer with their accounts to avoid heavy repossessions. Payments have been extended to keep cars sold in some instances.

Dealers in a number of cities reported fewer repossessions than last year, indicating that purchasers have been more careful in taking obligations.

Seven cities of the 24 in the report showed more repossessions than last year, while 12 found little or no difference between this year's record and that of last year.

Used car stocks were generally smaller than this time last year. Many dealers have emphasized used car sales, and have added salesmen to their new car departments. Factory policies of not crowding dealers with new cars have helped to keep used car stocks at a minimum throughout the country, although dealers in the eastern states found themselves unable to keep their stocks of used automobiles as low as those in other parts of the country.

During the summer months used car stocks of New York dealers have increased rather rapidly, resulting in a position almost as undesirable as that experienced last year, as opposed to a highly favorable experience during the first six months of the year with regard to used cars, however.

In Cincinnati the used car problem is more acute than usual, sales of used cars for the nine months in 1930 being approximately 25 per cent below those for the first nine months in 1929, with new car sales for the nine months' period this year showing an even greater decrease, approximating 35 per cent, all figures being based on total sales up to Sept. 23 and estimated sales for the last seven days of this month.

Throughout the North and Southwestern states there seemed to be more optimism than in Eastern and Middle Western states of the country.

Unsprung Weight is Greatly Reduced

Elimination of conventional axle center and method of attaching units to chassis increase advantages of this system of independent springing + + +

THE use of springs for supporting the chassis directly on stub axles (instead of on a continuous axle) is a very alluring possibility. In conventional designs the weight of the chassis is taken first on the chassis springs and then on the axle. Both of these have spans substantially equal to the width of the vehicle and both must have sufficient beam strength to carry the full load, hence it is obvious that considerable weight could be saved if the axle center could be eliminated. What makes this saving particularly attractive is that all of the weight of the axle is unsprung weight. Moreover, if springs are used to support the chassis directly on stub axles, the heavy part of the half-elliptic or quarter-elliptic springs is secured to the chassis frame and therefore is sprung weight, whereas in a conventional car the heavy part of the semi-elliptic springs is secured to the axle and is unsprung. Hence the reduction in unsprung weight is even greater than the total saving in weight.

In the conventional design the half-elliptic springs, however, serve not merely as suspension members, but also as thrust members or radius rods—for the front axle in all cases and for the rear axle when the Hotchkiss drive is used. Where stub axles only are employed it is, of course, possible to provide radius rods the same as in the conventional design, and in heavy vehicles they are probably indispensable. However, in the case of the lighter passenger cars it is the general endeavor of designers to so arrange the springing that no radius rods are required. All forces in the direction of the axis of the car can readily be taken care of if four half-elliptic springs are used at both front and rear, two above the stub axle and two below, two in front and two in back of it.

The use of four semi-elliptic or eight quarter-elliptic springs at both front and rear is rather objectionable, however, for although no more material is required than if all of the load rested on a single spring designed to give the same "rate," division of the material into so many units must necessarily add to the cost. For this reason most of the designers who use this type of suspension provide two springs only.

A particularly neat design is that of the front suspension of the Roehr car, illustrated in Fig. 1. The two semi-elliptic cross springs are spaced a consider-

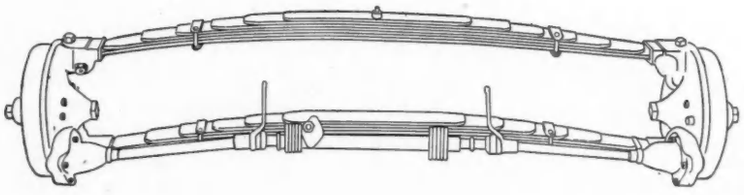


Fig. 1—Roehr front suspension—stub axles supported on two cross springs + + + +

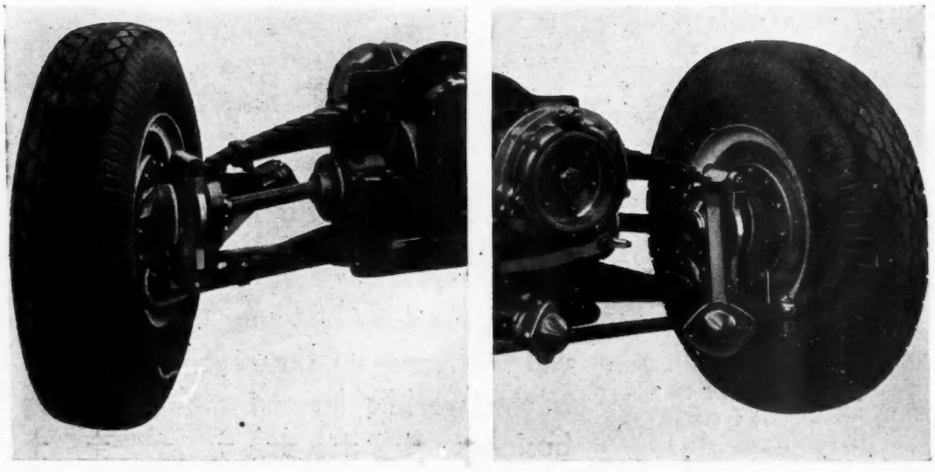


Fig. 2—Front suspension of Voran bus chassis with diagonal radius rods +

With Stub-Axle Type of Suspension

By P. M. Heldt

"Reduction of unsprung weight"—the lodestar of engineers and designers—is closely connected with the new trend toward riding comfort combined with the increased power of the modern automobile.

In this, the third of a series of five articles, Mr. Heldt describes how springs take the place of a large portion of axles in a number of cars now in production.

The fourth and fifth articles of the series will appear in the two issues following the Production Issue of October 18 + + + + + + + +

able distance apart vertically, and their eyes are pin-jointed to blocks which also form steering yokes. Swiveled to these fittings at the ends of the springs are the brake backing plates which are provided with a central boss into which the wheel spindle is secured. It can be plainly seen in the illustration that the upper spring is not directly above the center of the backing plate and the center of the wheel spindle, but offset therefrom; by this means increased resistance to forces in the direction of the car axis is obtained, for with the two springs offset relative to each other in the horizontal plane, forces parallel to the car axis no longer produce plain bending stresses in the springs. The assembly of two springs then acts somewhat like a truss, one spring being subjected to compressive and the other to tensile stresses.

A construction in which two cross springs are used, one directly above the other, and thrust in the direction of the vehicle axis is taken on radius rods as shown in Fig. 2. This is the Voran design which has been embodied in buses for service in Berlin and London, and in a lighter form in the Selve passenger car. These vehicles have front drive, and the two cross springs are arranged on top and below the final-drive housing respectively.

In the Alvis front-drive car the front wheels are independently suspended by means of four quarter-elliptic cantilever springs each, as shown in Fig. 3. These springs are anchored to the frame side rails and, therefore, are comparatively short. The ends of the four springs are pin-jointed to a substantially hemispherical housing made in halves (top and bottom), with trunnions in which the knuckle is swiveled. The front and rear springs of the front suspension, instead of being parallel, are made to di-

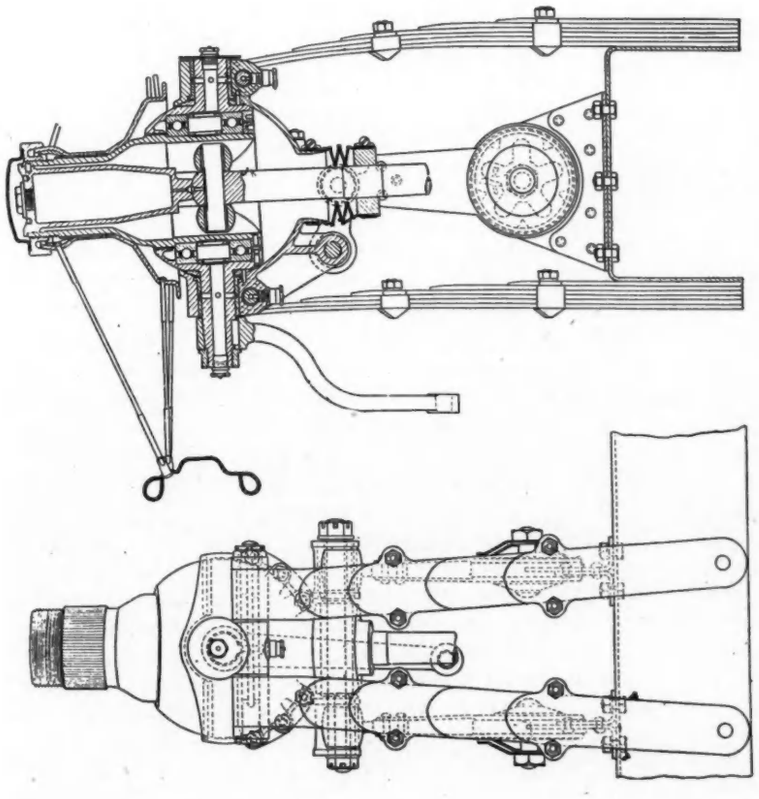


Fig. 3—Alvis front suspension on eight short cantilever springs +

verge as they approach the frame side rail, to get a broader base on the rail, with reduced strain on the fastenings, and there is a disk-type of shock absorber between each pair of springs, the housings of the shock absorber being secured to the outside of the frame rail, while the shock absorber arms are linked to an arm on the lower half of the hemispherical housing forming the steering head.

A combination of a single cross spring with a pair of links in the form of shock absorber arms is found in the French Sizaire car. Rear stub axles take the chassis load through the intermediary of a semi-elliptic cross spring clipped to the bottom of the differential housing, which latter, of course, is supported on the chassis frame. Short links (shock-absorber arms) extend from the frame side rails to the upper portion of circular plates which support the stub axles and the brakes. The mounts for the stub axles are further braced in the direction of the car axis by diagonal rods extending to the rear from the frame brackets.

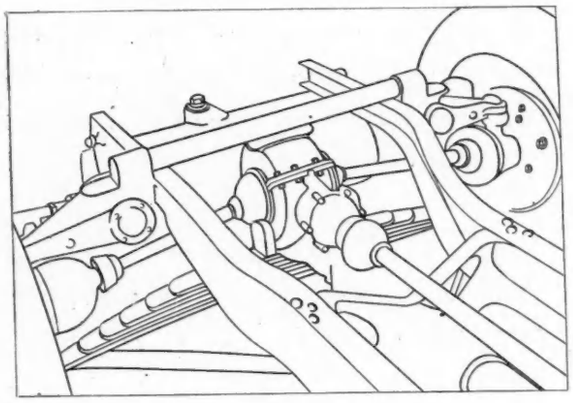


Fig. 4—Rear suspension of 15 hp. Sizaire car employing one cross spring and links from frame side rails + + + +

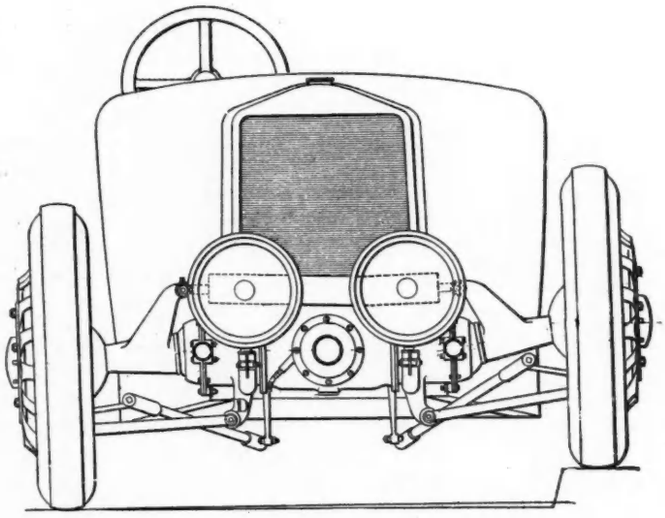


Fig. 5—Bucciali front suspension, in which stub axles are carried by double links of unequal lengths + + +

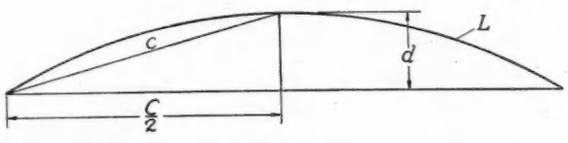


Fig. 6—Diagram for relation between lengths of circular arc and its cord

Bucciali Methods

In the Bucciali car the steering heads at the front are supported by a pair of links each. The lower links are pin-jointed to brackets on the bottom of the transmission housing, while the upper links are axle tubes surrounding the propeller shafts. These latter have universal connections to the transmission housing and are provided with arms extending inward and upward, to which the suspension means, located in a cylinder between their ends, are connected. The difference in the lengths of the links has a compensatory effect on the tread under conditions of spring action, as will be explained further on in connection with spring-mounting of stub axles.

A question that always arises with constructions having no rigid axle assuring a definite spacing of the wheels at opposite ends of it, is what is the effect of spring action on the wheel tread? Any material change in tread is objectionable in that it produces scuffing of the tire treads and consequent rapid wear of same. In fact, it has been rumored that the reason one foreign design with swinging axles, in which a prominent manufacturer became interested some seven or eight years ago, was never placed in regular production, was that the tread variations were so great that it was impossible to keep tires on the wheels.

With the steering heads supported by parallel cross springs of equal dimensions, the two wheels on opposite sides will always remain parallel with each other or at the particular slight inclination for which the design is arranged. With a change in the camber of the spring there will be, of course, a slight change in the tread or the distance apart of the center points of the wheels. This can be minimized by so choosing the camber that the springs are flat when under normal load so that in operation the springs play equally to both sides of this position.

In the design of leaf springs it is the endeavor to so arrange matters—by using numerous leaves and pointing the ends—that the stresses are uniformly distributed throughout the material. If this condition held strictly true and the master leaf formed a straight bar when under normal load, then any change in load would result in its assuming the form of a circular arc. It is thus a comparatively easy matter to determine the changes in the distance apart of the spring eyes with variations of the deflection of the spring, or, more correctly, with variations in the camber.

The relation between the length of the arc and the length of the cord is generally given as follows:

$$3\,L = 8\,c - C,$$

where L is the length of the arc; C, the length of the cord, and c the length of the cord of half the arc. Referring to Fig. 6 it can be seen that

$$c = \sqrt{(C/2)^2 + d^2},$$

where d is the height of the arc (the deflection in our case). It is evident that

$$8\,c = \sqrt{16\,C^2 + 64\,d^2}$$

and

$$3\,L = \sqrt{16\,C^2 + 64\,d^2} - C$$

which when solved for C gives

$$C = 0.8\sqrt{L^2 - 6.66\,d^2} + 0.2\,L$$

For $L = 40$ in. and $d = 1$ in. C figures out to 39.916 in., showing that for a deflection of 1 in. the tread is reduced (or increased) by less than 0.1 in. For a deflection of 5 in. which might occur in the case of the rear springs, the tread would be reduced or increased by 1.706 in. We have here assumed that the spring is straight either at the beginning or the end of the deflection. The change in tread is further reduced if part of the deflection is to one and part to the other side of the straight position, while it is increased if the spring has a positive camber throughout the deflection and does not straighten out completely.

Variations Compensated

It is possible to compensate for the tendency of the tread to vary under spring action by using upper and lower springs (or a spring and a link) of different lengths. Assume, for instance, that we have a design in which the camber of the cross spring is always positive. Then the tread tends to increase as the spring deflection increases. Now assume that the plane of the wheel is vertical under normal load and that the upper spring is somewhat shorter than the lower one. For a given deflection the distance apart of the spring eyes will vary most in the case of the shorter spring. Therefore, if the deflection of the springs is increased, the wheels will no longer stand vertical, but will be gathered in at the bottom as in horse vehicle practice, and the increase in the distance apart of the centers of the wheels can be compensated for by this gather.

Let us assume that the distance apart of the eyes of the lower spring increases by a distance a as the spring is compressed to the straight condition. The stub axle must then be swung around the eye of this spring through such an angle that the resultant lateral sliding motion of the wheel on the road surface is $a/2$. This

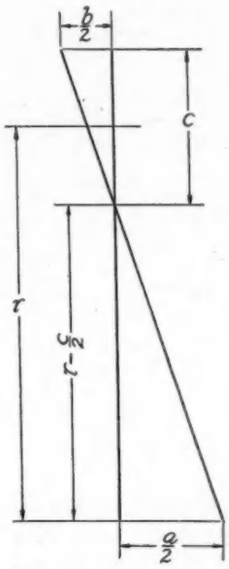


Fig. 7—Diagram showing relation of parts of mechanism when stub axle is supported by leaf springs of unequal length + + + + + +

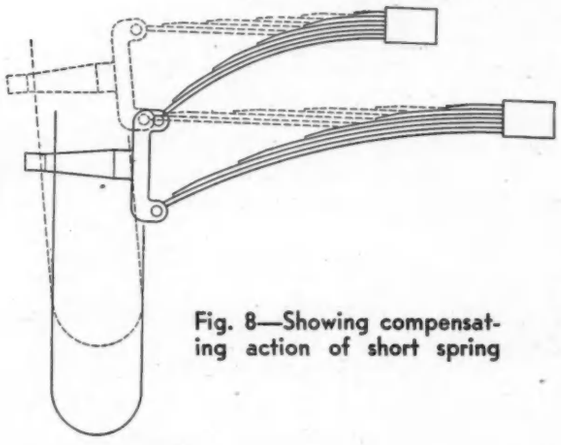


Fig. 8—Showing compensating action of short spring

necessitates that the eyes of the upper spring be moved apart a greater distance than a, say $a + b = e$. Let the vertical distance between the two spring eyes on the same side be c and the wheel radius r. Then, referring to the diagram Fig. 7, it will be seen that

$$(b/2) : c = (a/2) : (r - c/2),$$

which gives

$$b = \frac{c\,a}{r - c/2}$$

To determine what must be the length of the upper spring so that its eyes will move apart a distance e, we proceed as follows:

When the spring is in the normal position and has a camber d, the length of the cord is evidently $L - e$. Substituting this for C in the equation for the latter value we get

$$L - e = 0.8\sqrt{L^2 - 6.66\,d^2} + 0.2\,L$$

which can be simplified to read

$$0.8\,L - e = 0.8\sqrt{L^2 - 6.66\,d^2}$$

Squaring both sides

$$0.64\,L^2 + e^2 - 1.6\,e\,L = 0.64\,L^2 - 4.26\,d^2$$

which gives

$$1.6\,e\,L = 4.26\,d^2 + e^2$$

and

$$L = \frac{4.26\,d^2 + e^2}{1.6\,e}$$

Main Spring Application

Let us now apply the equations derived in the foregoing to the case of a main spring 40 in. long, with a deflection of 4 in. The length of the cord when the spring has a camber of 4 in. is

$$C = 0.8\sqrt{40^2 - 6.66 \times 4 \times 4} + 0.2 \times 40 = 38.645 \text{ in.}$$

Thus when the spring with an original camber of 4 in. is deflected until it is completely flattened out the tread of the vehicle is increased by a distance

$$a = 40 - 38.645 = 1.345 \text{ in.},$$

and each wheel will slide laterally over the ground a distance

$$(a/2) = 1.355/2 = 0.677 \text{ in.}$$

Now let us assume that the wheel radius r is 15 in. and the distance apart c of the upper and lower spring eyes (center distance) is 5 in. Then the distance b by which the extension of the short spring exceeds that (a) of the long spring is

$$b = \frac{5 \times 1.355}{15 - 2.5} = 0.542 \text{ in.},$$

and the entire extension e of the short spring ($a + b$) is

$$e = 1.355 + 0.542 = 1.897 \text{ in.}$$

By now inserting values in the equation for the length of spring which will give this increase in length when straightened from a camber of 4 in., we get

$$L = \frac{(4.26 \times 4 \times 4) + (1.896 \times 1.896)}{1.6 \times 1.896} = 23.65 \text{ in.},$$

and the active part of each half of the spring therefore must be

$$23.65/2 = 11.83 \text{ in. long.}$$

The effect of thus making upper and lower cross springs supporting stub axles of different length is illustrated in Fig. 8. It will be seen that as the springs deflect the wheel tilts and the center point of ground contact remains on the same vertical line, that is, there is no sideward scuffing of tires.

Gasoline of Low Sulphur Content is Readily Available

SULPHUR content of commercial gasoline is the primary cause of crankcase corrosion, and since this has caused considerable trouble to automobile manufacturers they have been insisting on a low sulphur limit in fuels. A report of the Bureau of Mines (No. 3026) points out that gasolines made from certain stocks normally contain a relatively large amount of sulphur compounds. The generally used process for reducing the sulphur content results in the loss of a significant part of the gasoline fraction, and the expenses for chemicals, labor and other incidentals of the process place an added economic burden on the producers using high-sulphur crudes. Although in some cases the treating losses and the additional cost have been comparatively great, the survey shows that reduction of sulphur content in motor fuels is a problem to only a small proportion of the refiners and of no concern to the remainder.

The survey for sulphur content was made at the same time as the survey of fuel volatility referred to in a recent issue of *Automotive Industries*, in January last.

It has been contended recently by some refiners that the treatment for sulphur reduction has the effect of decreasing the anti-knock rating of the fuel. In fact, some refiners consider that the increased anti-knock rating that is obtained when a gasoline is not treated solely to reduce its sulphur content, is preferable to low sulphur content. The higher sulphur content, it is pointed out, is objectionable only under certain climatic and operating conditions.

The results of the survey indicate that representative motor fuels now being sold in the United States contain relatively small proportions of sulphur. As compared with the survey made in July, 1927, a larger proportion of the total number of samples contain more than 0.10 per cent of sulphur. However, more than 90 per cent of the samples analyzed had 0.10 per cent sulphur or less, and 72.5 per cent had 0.06 per cent sulphur or less. These motor fuels of low sulphur content are found in every city in which samples were taken and it appears that so long as conditions remain substantially as at present, no difficulty should be experienced in obtaining gasoline under a specification requiring that the sulphur content shall not be more than 0.10 per cent.

AN interesting discussion of the use of color for industrial painting is found in a little volume, **"The Light Reflection Value of Color Paint,"** which has been just published by The New Jersey Zinc Co., New York.

Australia Enters Leanest Period As Tariff Schedule is Fattened

Apparent expansion of last year fundamentally deceptive because of artificial means used to stimulate markets and attain stability

By Hugh Croll

Conditions "Down Under"—

This is the second of a series of three articles on Australian and New Zealand automotive conditions by Hugh Croll, written especially for *Automotive Industries* + + + + + +

STEADY all-round expansion marked the Australian motor vehicle and motor accessory industry until two years ago.

In the decade preceding the end of 1927 the value of the output of the local plants in the Commonwealth increased five-fold from an annual total in 1919 of approximately $10,500,000 to about $52,000,000 at the dawn of 1928.

First signs of the present depression became apparent about the middle of that year when Federal statistics on the production of Australia's motor body and accessory industry indicated a recession from the preceding 12-month period of some $5,000,000. Official or complete figures are not yet available for the past year from all six states of the Australian Commonwealth, but both manufacturers and distributors admit that the automotive industry is encountering the leanest period of its quarter century of existence.

Although the local motor industries had been healthy up to the beginning of the recent economic crash, the apparent expansion was to a degree fundamentally deceptive on account of the artificial means, principally tariff-making, of promoting markets and stability.

An accompanying table, however, indicates the progress of the industry until increasing financial stringency set the legislators of Australia to an orgy of upward tariff revision in quest of a panacea for their country's ills.

When the present drastic customs schedule was adopted at Canberra, the Federal capital, in July of this year, leaders in the Australian motor industry began to realize that their political knight-errant had been wielding a two-edged sword.

Motor chassis and engine imports took a blow below the belt and the effects of this customs knockout immediately became apparent in diminished calls on the local auto body and accessory plants. Lay-offs among employees in the industry, which started 12 months ago, have been increasingly drastic since the third and latest revision of the customs tariff this year.

In the absence of comprehensive or official data on the motor industry for the fiscal year 1929-30 (the period of tariff skyrocketing), leaders in the field in Sydney, which represents almost one-third of the industry in Australia, were unwilling to commit themselves as to the extent of the slump. But none who commented hesitated to say that the situation was one of extreme gravity and that the outlook was most discouraging.

Along with the tariff, which is producing negative results in the home motor industry, the Aus-

$15 Carburetor Duty To Aid 3-Man Concern

Among the first motor accessory items to feel the pinch of Australia's thrice-revised 1930 tariff were carburetors.

On recommendation of the Tariff Board, the Federal Labor Party imposed a duty of 3 pounds sterling (about $15) each on all imported carburetors irrespective of country of origin.

This impost, according to the Board, was urged to protect the three employees of the only firm in Australia which manufactures carburetors.

Registration of Motor Vehicles

	The Commonwealth		New South Wales
1920	110,357	1920	40,907
1920-21	117,163	1921	44,443
1921-22	139,090	1922	52,676
1922-23	175,170	1923	70,314
1923-24	241,869	1924	95,027
1924-25	305,639	1925	123,591
1925-26	390,300	1926	156,073
1926-27	495,540	1927	192,094
1927-28	565,154	1928	227,278
1928-29	634,259	1929	247,538

Automobile ownership evenly divided between urban and rural population.

Capital Invested in Automotive Plants in Australia During Last Nine Years

	Land and Building £	Plant and Machinery £	Output £
1919-20	1,042,292	270,347	2,134,574
1920-21	1,926,307	552,172	3,292,422
1921-22	2,409,508	627,182	3,788,157
1922-23	2,831,845	696,136	5,053,313
1923-24	3,876,950	931,599	6,997,974
1924-25	4,860,243	1,167,661	8,767,145
1925-26	5,855,705	1,537,193	9,343,580
1926-27	7,219,471	1,801,398	10,568,277
1927-28	7,254,664	2,291,394	9,590,549

Australian Employment Census

	Rural Industries (Which includes dairy-farming, pastoral pursuits and all kinds of rural development)		Manufacturing
	Males	Females	Males and Females
1917-18	328,000	121,490	328,000
1918-19	326,000	118,000	340,000
1919-20	342,000	107,000	376,000
1920-21	350,000	106,000	386,000
1921-22	366,000	112,000	395,000
1922-23	370,000	107,000	412,000
1923-24	367,000	91,000	429,000
1924-25	373,000	78,000	439,000
1925-26	368,000	63,000	450,000
1926-27	366,000	58,000	467,000
1927-28	370,000	52,000	464,000

Total population (6,500,000) about 50:50 urban-rural

tralian motor world has also to contend with an increased Petrol (gasoline) tax, which, with primage, amounts to about 15 cents a gallon. On top of this, the Federal Government has just imposed a sales tax of 2½ per cent on the gross turnover on all goods and commodities, manufactured locally or imported. Only a few exemptions, notably on primary products (wool and pastoral), are written into this money-getting piece of legislation which has provoked universal protest.

The sales tax, according to R. A. Marks, president of the Associated Chamber of Manufacturers, is virtually the last straw. Yet, even in face of all this, an undercurrent of dogged optimism prevails in industrial circles, more so in the motor field than in others.

"We have got to make the best of it," said Mr. Marks. "As far as the manufacturers are concerned they are resigned to the necessity of facing the obligations conferred upon them by this tax," but he indicated that they viewed this latest impost with "considerable diffidence."

His attitude summed up the general opinion prevalent in automobile circles. Executives were at a loss to suggest a way out as far as the future was concerned, their attitude being that the trade must "mark time" and fight rather against further impositions than those already in force.

To this end there recently was formed the Combined Motoring Interests which has met with Prime Minister Scullin at Canberra, and on several occasions presented to him a picture of the seriousness of the situation. A spokesman for the group estimated that at the beginning of August employment in the motor industry in Australia was 30 per cent less and turnover 60 per cent less than a year ago.

Former Federal Treasurer Theodore said the industry "could not carry additional burdens" in reply to a deputation prior to imposition of the Petrol tax, but since his enforced retirement from the government, delegations have come back from the Federal capital with little or no satisfaction.

Low Expansion Aluminum Piston Alloy Developed

THE past year has witnessed the adoption of a new aluminum piston alloy by some of the leading manufacturers of aircraft, automobile, bus and marine engines. This alloy, developed by the Aluminum Company of America as No. 132, is claimed to constitute the first improvement in piston materials since the introduction of the aluminum alloy containing 10 per cent copper and a small percentage of magnesium.

The coefficient of expansion of No. 132 alloy and Ni-Resist, a comparatively new variety of cast iron containing nickel, which was developed by the International Nickel Co., are almost identical. When pistons in this new low expansion alloy are used in engines having Ni-Resist removable sleeves, they may be fitted with the same small clearances which are employed with cast-iron pistons operating in cast-iron cylinder blocks.

Linear Inertia Force of Connecting Rod Resolved Into Two Components

Analysis directs attention to the effects produced on the main bearing, piston-pin bearing and to the torques on the crank and frame + + + + +

By M. W. Davidson
Professor of Mechanical Engineering
University of South Dakota

THERE have been numerous inventive efforts to produce a mechanism for the transformation of reciprocating motion into rotary motion, and vice versa, which would successfully replace the conventional connecting-rod arrangement. But, in spite of its faults, there has been no development to date that promises to serve as a successful substitute.

Therefore in view of the importance of the connecting-rod mechanism to the reciprocating engine in particular, and to machinery in general, an accurate realization of the dynamic effect of the inertia of the connecting-rod on bearing and guide pressures, crank and frame torques, and on vibration, should be useful to everyone having an interest in reciprocating machinery.

In discussions of engine balance, consideration is generally given to the effect of the inertia of the reciprocating parts, and to the linear inertia of the connecting-rod, but usually a precise study of the linear effect of the latter is not made, and its angular inertia effect is generally ignored. Also it would appear that because the fluid pressure effects on the crank and frame are those of equal and opposite couples together with equal and opposite axial forces on the frame, the assumption is sometimes made that the inertia force modifications of the fluid pressure will result in crank torques that represent the vibratory condition of the engine.

The general effect of the force and couple necessary for the linear and angular acceleration of the connecting-rod is to produce different dynamic effects simultaneously on the crank and frame, so that a study of the variation of the crank torque does not represent the vibratory condition of the engine, unless these effects are balanced by counter effects of other connecting-rods and reciprocating weights. And, if all the inertia forces and effects are in balance, the only study of vibration that is necessary, aside from the effects produced on elastic materials, is the variation of the fluid torque.

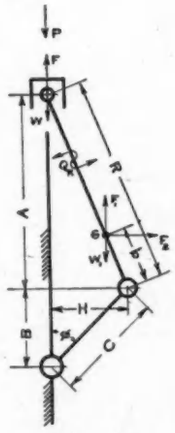


Fig. 1

In the following analysis the writer will consider the linear inertia force of the connecting-rod as composed of two components acting through the rod's mass center, one axial, and the other perpendicular to the engine's axis, and each of these components will be examined separately. The couple necessary for the angular acceleration of the rod will be studied also, and in all of the analyses particular attention is directed to the effects produced on the main bearing, piston-pin bearing, and to the torques on the crank and frame.

In an article appearing in the September, 1927, issue of the Journal of the Society of Automotive Engineers, the writer presented certain forms of the expression for the forces and couple necessary for the acceleration of the reciprocating parts and the connecting-rod. These equations give accurately these quantities for any ratio of crank to connecting-rod, and in one of the forms given all angular functions are eliminated in favor of the projected lengths of the crank and the rod on the axis of the engine and on a perpendicular to that axis. These equations are repeated herewith, and similar forms of expression will be given for the forces and couples arrived at through the several analyses.

Referring to Fig. 1, and the equations throughout the paper, distances whose origin is the center of the crankshaft will be plus when up and to the right, and minus when down and to the left. Forces up and to the right will likewise be plus, and minus when down and to the left.

Mathematical Symbols Used in Equations

W, weight of the reciprocating parts.

W_1, weight of the connecting-rod.

F, inertia force of the reciprocating weights.

F_1, axial component of the linear inertia force of the connecting-rod.

F_2, cross component of the linear inertia force of the connecting-rod.

Q_R, couple for the angular acceleration of the connecting-rod.

I_G, moment of inertia of the connecting-rod about its mass center.

S, speed of the crankshaft in r.p.s.

V, velocity of the crankpin center in feet per second.

g, acceleration due to gravity.

G, mass center of the connecting-rod.

R, length of the connecting-rod in feet.

C, length of the crank in feet.

K, $R^2—C^2$.

Φ, crank angle shown.

b, distance in feet of the rod's mass center from the center of the crank-pin.

A, length in feet of the projection of the rod on the axis of the engine.

B, length in feet of the projection of the crank on the axis of the engine.

H, length in feet of the projection of the crank or rod on a line perpendicular to the axis of the engine.

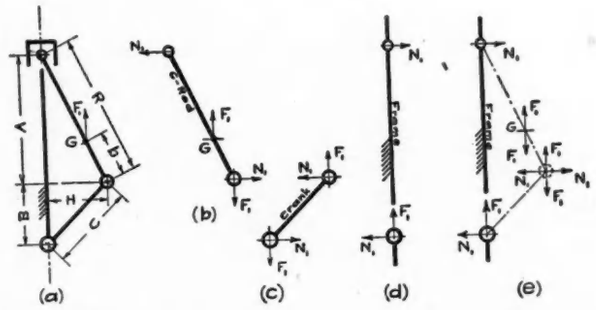


Fig. 2

The force necessary for the acceleration of the reciprocating parts is,

$$F = \frac{W\ V^2}{g\ C^3}\left[\frac{R^2\ B^3}{A^4} - \frac{H^3}{A} + B\right] \ldots\ldots\ldots\ldots (1)$$

The force necessary for the axial acceleration of the connecting-rod is,

$$F_1 = \frac{W_1\ V^2}{g\ C^2}\left[\frac{b}{R}\cdot\left(\frac{R^2\ B^2}{A^3} - \frac{H^2}{A}\right) + B\right]$$

The force necessary for the cross acceleration of the connecting-rod is,

$$F_2 = \frac{W_1\ V^2}{g\ C^2}\ H\left(1 - \frac{b}{R}\right)$$

The couple necessary for the angular acceleration of the connecting-rod is,

$$Q_R = 4_n{}^2\ S^2\ I_G\ K\ \frac{H}{A^3}$$

The axial component of the force for the linear acceleration of the connecting-rod is given as follows:

The axial component F_1 of the force for the linear acceleration of the connecting-rod is given by equation (2), and Fig. 2 represents an analysis showing the forces on the connecting-rod, crank and engine frame for equilibrium of the rod. The effect on the crank is seen to be that of a couple Q_1, given by the expression,

$$Q_1 = —F_1\ H + N_1\ B \ldots\ldots\ldots\ldots\ldots (a)$$

(using the force signs of the crank-pin end) and the effect on the frame is that of an axial force F_1, applied at the main bearing, together with a couple represented by equal and opposite forces N_1, acting perpendicular to the axis at the main bearing and wrist-pin bearing respectively. The force N_1, with the sign for the main bearing is given by the expression,

$$N_2 = -\frac{F_1\ H\ b}{A\ R} \ldots\ldots\ldots\ldots\ldots\ldots (b)$$

And that for the couple Q_2 on the frame is,

$$Q_2 = N_1\ (A + B) = \frac{F_1\ H\ b}{A\ R}\ (A + B) \ldots (c)$$

Examination of the above equations and those of Fig. 2 shows that the couple on the frame is not the same as that on the crank. But by the application of equal and opposite forces at points in the frame coincident with the positions of the crank-pin center and the mass center of the connecting-rod, as shown in (e) of Fig. 2, it is readily seen that the effect on the frame of this force component is a couple equivalent to that on the crank together with a force equal to and of like sign as that component, which acts parallel to the engine axis through the mass center position of the connecting-rod. Therefore, the vibratory effect on the frame of the engine is not represented by the crank torque, but by a different torque and an axial force;

or by a torque of opposite sign and equal value to that on the crank together with a like force acting parallel to the axis and located as above described.

The cross component F_2 of the force for the linear acceleration of the connecting-rod is given by equation 3, and Fig. 3 represents an analysis showing the forces on the connecting-rod, crank and engine frame for equilibrium of the rod. The effect on the crank is seen to be a couple Q_3 given by the expression

$$Q_3 = N_3 B = F_2 B (1—b/R) \ldots\ldots\ldots\ldots (d)$$

Effect on Frame

The effect on the frame is that of two parallel forces acting perpendicular to the engine axis at the main bearing and piston-pin bearing. The force at the piston-pin bearing N_2 is given by the expression

$$N_2 = F_2 b/R \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (e)$$

And that at the main bearing N_3 is given by the expression

$$N_3 = F_2 (1—b/R) \ldots\ldots\ldots\ldots\ldots\ldots\ldots (f)$$

By the addition of two equal and opposite forces N_3, acting on the frame through the position of the crank-pin center and perpendicular to the engine axis, as illustrated in (*e*) of Fig. 3, the effect of these two forces N_2 and N_3 on the engine frame is shown to be equivalent to a torque equal to and of opposite sign to that on the crank together with the addition of a force F_2, acting through a point on the frame coincident with the position of the mass center of the connecting-rod and perpendicular to the axis of the engine. Or, by the addition of equal and opposite forces N_3, acting perpendicular to the engine axis at the main bearing, the effect on the frame is shown at (*f*) of Fig. 3, to be equal to a couple Q_4 on the frame represented by the expression

$$Q_4 = N_2 (A + B) = F_2 b (A + B)/R \ldots (g)$$

together with a force F_2 acting at the main bearing perpendicular to the engine axis. And, as in the case of the axial component, these results show that the vibratory effect on the frame of the engine is not given by the crank torque.

The couple Q_R for the angular acceleration of the connecting-rod is given by equation (4), and Fig. 4 represents an analysis showing the forces on the connecting-rod, crank and frame for equilibrium of the rod. Then, as the bearing reaction at the piston-pin is necessarily perpendicular to the engine axis for no friction, the effect on the crank is shown to be a couple Q_5 given by the expression

$$Q_5 = N_4 B = Q_R B/A \ldots\ldots\ldots\ldots\ldots\ldots (h)$$

and that on the frame by a couple Q_6 represented by the expression

$$Q_6 = N_4 (A + B) = Q_R (1—B/A) \ldots\ldots (i)$$

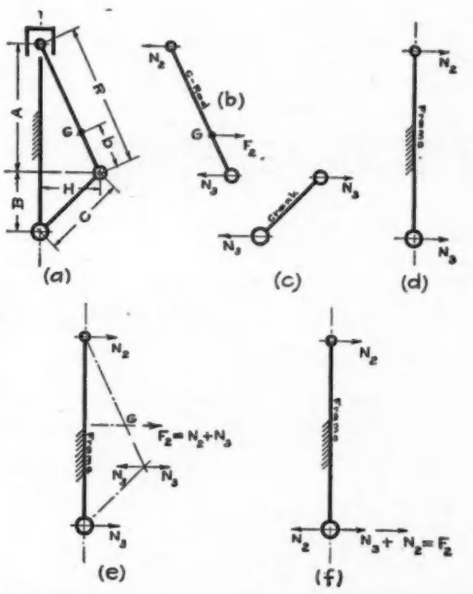


Fig. 3

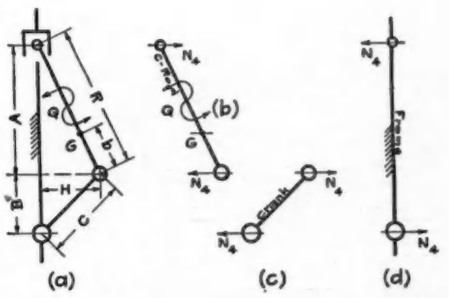


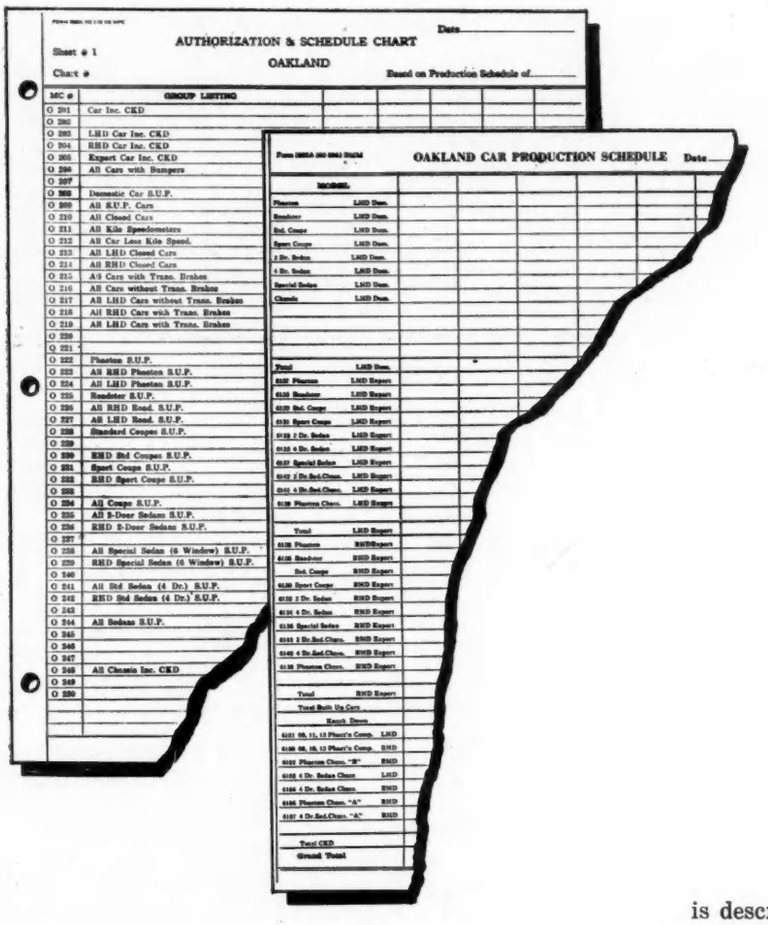
Fig. 4

The effect of this element of the connecting-rod inertia is also seen to be very different for the crank and frame respectively, and at the 90-deg. position, where the crank is perpendicular to the engine axis, the frame effect will be a maximum, while that on the crank will be zero. So here again it appears that the torque on the crank does not represent the vibratory effect on the engine frame.

By the use of diagrams similar to those used for the study of the connecting-rod, it will be found that the effect of the inertia of the reciprocating weights results in a torque on the frame equal and opposite to that on the crank together with an axial force through the main bearing equal to that required for the acceleration of these weights. That the slight effect produced by the weight of the piston and connecting-rod is similar to that produced on the frame and crank by the reciprocating weight inertia force and the axial component of the force for the linear acceleration of the rod. Also, that the effect of the fluid pressure on crank and frame respectively is that of equal and opposite couples together with equal and opposite axial forces on the frame at the cylinder head and the main bearing.

Therefore, it would seem that only when the inertia effects are in balance does the variation of the crank torque represent the vibratory condition of the engine.

Synchronizing Materials to the Assembly



AUTHORIZATION & SCHEDULE CHART

OAKLAND

Sheet # 1

Chart #

Date

Based on Production Schedule of

MC #	GROUP LISTING
O 201	Car Inc. CKD
O 202	
O 203	LHD Car Inc. CKD
O 204	RHD Car Inc. CKD
O 205	Export Car Inc. CKD
O 206	All Cars with Bumpers
O 207	
O 208	Domestic Car S.U.P.
O 209	All S.U.P. Cars
O 210	All Closed Cars
O 211	All Kilo Speedometers
O 212	All Car Less Kilo Speed.
O 213	All LHD Closed Cars
O 214	All RHD Closed Cars
O 215	All Cars with Trans. Brakes
O 216	All Cars without Trans. Brakes
O 217	All LHD Cars without Trans. Brakes
O 218	All RHD Cars with Trans. Brakes
O 219	All LHD Cars with Trans. Brakes
O 220	
Q 221	
O 222	Phaeton S.U.P.
O 223	All RHD Phaeton S.U.P.
O 224	All LHD Phaeton S.U.P.
O 225	Roadster S.U.P.
O 226	All RHD Road. S.U.P.
O 227	All LHD Road. S.U.P.
O 228	Standard Coupes S.U.P.
O 229	
O 230	RHD Std Coupes S.U.P.
O 231	Sport Coupe S.U.P.
O 232	RHD Sport Coupe S.U.P.
O 233	
O 234	All Coupe S.U.P.
O 235	All 2-Door Sedans S.U.P.
O 236	RHD 2-Door Sedans S.U.P.
O 237	
O 238	All Special Sedan (6 Window) S.U.P.
O 239	RHD Special Sedan (6 Window) S.U.P.
O 240	
O 241	All Std Sedan (4 Dr.) S.U.P.
O 242	RHD Std Sedan (4 Dr.) S.U.P.
O 243	
O 244	All Sedans S.U.P.
O 245	
O 246	
O 247	
O 248	All Chassis Inc. CKD
O 249	
O 250	

OAKLAND CAR PRODUCTION SCHEDULE Date

MODEL	
Phaeton	LHD Dom.
Roadster	LHD Dom.
Std. Coupe	LHD Dom.
Sport Coupe	LHD Dom.
2 Dr. Sedan	LHD Dom.
4 Dr. Sedan	LHD Dom.
Special Sedan	LHD Dom.
Chassis	LHD Dom.
Total	LHD Dom.
6127 Phaeton	LHD Export
6128 Roadster	LHD Export
6129 Std. Coupe	LHD Export
6130 Sport Coupe	LHD Export
6131 2 Dr. Sedan	LHD Export
6132 4 Dr. Sedan	LHD Export
6137 Special Sedan	LHD Export
6142 2 Dr. Sed. Chass.	LHD Export
6144 4 Dr. Sed. Chass.	LHD Export
6138 Phaeton Chass.	LHD Export
Total	LHD Export
6127 Phaeton	RHD Export
6128 Roadster	RHD Export
Std. Coupe	RHD Export
6130 Sport Coupe	RHD Export
6132 2 Dr. Sedan	RHD Export
6134 4 Dr. Sedan	RHD Export
6138 Special Sedan	RHD Export
6143 2 Dr. Sed. Chass.	RHD Export
6145 4 Dr. Sed. Chass.	RHD Export
6138 Phaeton Chass.	RHD Export
Total	RHD Export
Total Built Up Cars	
Knock Down	
6101 6B, 7L, 12 Phaet's Comp.	LHD
6100 6B, 7B, 12 Phaet's Comp.	RHD
6121 Phaeton Chass. "B"	RHD
6125 4 Dr. Sedan Chass	LHD
6126 4 Dr. Sedan Chass	RHD
6106 Phaeton Chass. "A"	RHD
6107 4 Dr. Sed. Chass. "A"	RHD
Total CKD	
Grand Total	

Form 1—Master car production schedule, giving grand totals of each body style for a month ahead + +

Form 2—A break down into exact quantities of the totals given in Form 1 + + + + + + + +

Production line movements imply central control of complexities arising from hundreds of variations allowed in sales specifications.

WITH 897 possible variations in sales specifications comprising color options, body styles, chassis and wheels on the Oakland and Pontiac line alone, the job of production planning and scheduling to meet daily sales requirements assumes gargantuan proportions probably not wholly appreciated by those outside the planning organization. Just visualize the task involved in the initial forecasting of requirements; the purchase of materials within definite limits; scheduling of parts in the manufacturing department, and the final synchronization of all parts at the assembly lines feeding a daily sales schedule accurately and with consummate smoothness. Visualize, also, the flexibility required to revamp and reorganize this smooth-flowing stream of activity to accommodate sudden changes in sales requirements.

So little has been said about the actual mechanical details of this complex phase of automotive manufacture that we thought it would be of timely interest to study personally the planning organization of a number of outstanding, high-production automobile plants, among them the Oakland Motor Car Co., whose control system is described in this article. Incidentally the operation of this complex mechanism probably would be inadequate to the demands imposed upon it were it not for the recent introduction of the remarkable labor-saving devices such as the telautograph, teletype, and addressing machine. For example, at Oakland an addressing machine has cut down the mechanical work of writing requisitions and instructions to the manufacturing departments from 10 days to four hours for one man.

The planning department has two interdependent functions: (1) Production scheduling and (2) providing the necessary raw and finished materials from outside suppliers. But, before considering these in detail, let us pause a moment to study the essential, preparatory steps which precede the work on a new schedule.

The introduction of new models or the resumption of seasonal activities is preceded by a seasonal forecast by the management. This includes an estimate of the potential seasonal demands, a study of available equipment and tools, purchase of additional tools wherever required, and provision for additional manufacturing facilities if expansion is indicated. This preliminary work provides the tools with which the planning

Line Demands Exacting Attention

By Joseph Geschelin

The telautograph used in the Oakland plant typifies the central control of materials

The production line crews are notified at their respective stations of changes in the writing of the schedule clerk in the main station + + + + + +

department will work up the new models.

Actual work of planning becomes activated by a 90-day building schedule from the sales department giving the quarterly sales requirements, domestic and export. This schedule is firm for the first 30 days and tentative for the next 60. However, it is definite enough to serve as a basis for purchasing material from outside vendors.

The 90-day building schedule has practically no details other than body type. About the 25th of the month the sales department turns in a definite schedule for the first 10 days of the following month. This shows actual daily shipments but gives no other details except body style.

The 10-day schedule is followed by a definite daily shipping schedule which gives complete specifications as to body styles, color option, wheels and other variable details. This is given three days in advance, thus providing the lag in which the paint job schedules may be executed. To provide the flexibility for carrying out this program, as well as to accommodate the changes and revisions which sometimes occur, manufacturing departments have been set up to operate on a three-day "float." The term "float" is defined as the total number of pieces in process plus the finished pieces at the assembly line at any given time.

Form 3—Instruction for parts and sub-assemblies are revised periodically and readjusted for changes in production, shortages and other contingencies + +

Form 4—A definite plan for scheduling the movement of the assembly line is given in instructions three days in advance as to color option, wheels, trim, etc.

DEPARTMENT PRODUCTION SCHEDULE AND MATERIAL RELEASE

PLANT_____ MONTH_____

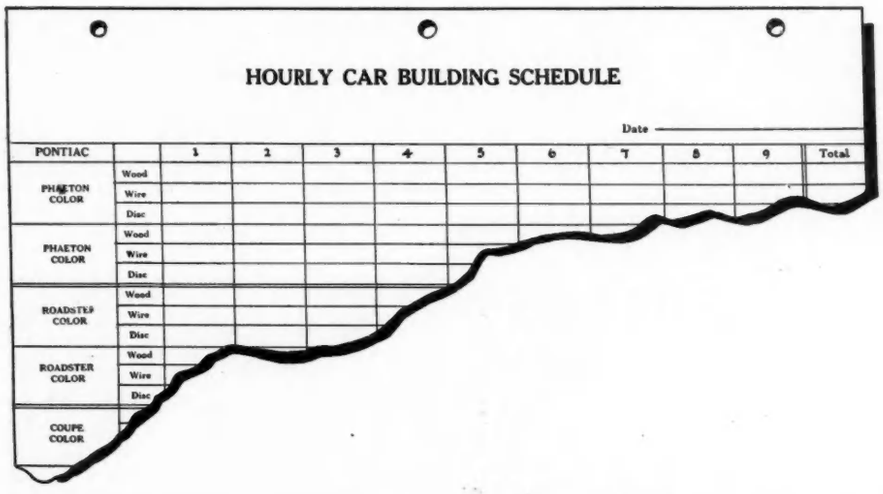
SHEET NO._____ OF_____

DEPT.	DESCRIPTION	NO. REQT.	MONTH BAL.	1 17	2 18	3 19	4 20	5 21	6 22	7 23	8 24	9 25	10 26	11 27	12 28	13 29	14 30	15 31	16	PROD. TOTAL AND BAL.	TOTAL EXCESS MAT.

CAR SHIPPING LIST

DATE_____

ORDER NO.	DESTINATION	OAKLAND						PONTIAC					
		ROAD.	COUPE	SPT. COUPE	5-DOOR	4-DOOR	SPEC.	ROAD.	COUPE	SPT. COUPE	5-DOOR	4-DOOR	SPEC.



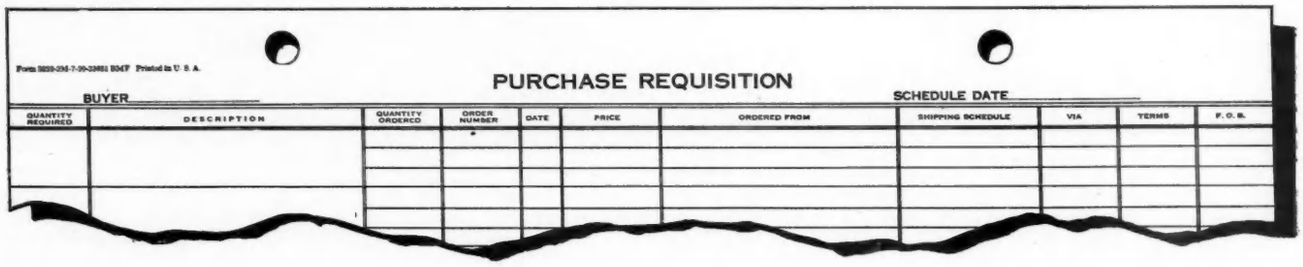
HOURLY CAR BUILDING SCHEDULE

Date _____

PONTIAC		1	2	3	4	5	6	7	8	9	Total
PHAETON COLOR	Wood										
	Wire										
	Disc										
PHAETON COLOR	Wood										
	Wire										
	Disc										
ROADSTER COLOR	Wood										
	Wire										
	Disc										
ROADSTER COLOR	Wood										
	Wire										
	Disc										
COUPE COLOR											

Form 5—The hourly car-building schedule is used with the total daily requirements broken down to shipping requirements and plant capacity, derived from Form 4

Form 6—Purchase requisition compiled by the planning department for the purchasing department + + + + + +



Form 3210-234-7-30-23031 B&F Printed in U. S. A.

PURCHASE REQUISITION

BUYER _____ SCHEDULE DATE _____

QUANTITY REQUIRED	DESCRIPTION	QUANTITY ORDERED	ORDER NUMBER	DATE	PRICE	ORDERED FROM	SHIPPING SCHEDULE	VIA	TERMS	F. O. B.

Thus, the planning department begins its building program with the following five schedules provided by the management and the sales department: (1) Broad plans for the entire season. (2) Tentative quarterly sales schedules. (3) Definite program for the first 30 days of the quarter. (4) Shipping schedules for the first 10 days of the month. (5) Daily shipping schedules with complete specifications.

The 90-day sales program is received on the 20th of the month and forms the basis for the master car schedule (Form 1), giving grand totals each month for each body style. Now the totals on Form 1 are broken down into component parts and listed on a group of forms of which Form 2 is sheet No. 1 and representative of the rest. By this means the exact quantities of each unit are definitely fixed for the quarter. Copies of the master schedules with supplementary schedules for major units are then sent to all department heads, the final totals taking into account the previously determined float, service department requirements and special units for outside customers.

These schedules give the operating heads the general plan for 90 days. Following this, they receive a schedule giving fixed instructions for the next 30 days. It goes to the superintendent and department heads and gives the number of major units required, the number of days this plant will operate during that month, the number of working hours per day, and an estimated average hourly rate of production. But, in addition to major units, many departments provide parts and sub-assemblies required by other departments, and upon which the functioning of the other departments largely depends. Instructions covering such parts are detailed on Form 3 which is issued on the 20th of the month and completely revised on the 1st of the following month. At each revision the quantities are readjusted to take care of changes, shortages and other contingencies. Copies of this form go to the superintendents, foremen, shipping department and receiving department.

Around the 25th of the month, the sales department turns in the schedule, giving definite shipments for the first 10 days of the following month. This enables the planning department to line up body deliveries and to establish the flow of body styles necessary to meet these requirements.

Finally, definite daily shipping instructions, given in detail on Form 4, provide the shop scheduling department with a definite plan for scheduling the movement of the assembly line. These instructions given three days in advance show exact specifications as to color option, wheels, trim and other details; moreover, each horizontal line gives the number of cars in an arrangement designed to provide carload lots.

It is important to note that the responsibility for carrying out the schedules in manufacturing departments rests entirely with the department head. To assure complete cooperation and coordinated effort throughout the plant, weekly meetings of the foremen are regularly held to determine the course of action on each new schedule as it is released.

At this stage, the center of the planning function shifts to the shop scheduling department whose function is to control the flow of materials from manufacturing departments to the assembly lines; to schedule sheet metal parts and wheels to the enamel and color departments, and to control the sequence of body types along the assembly line so as to meet the daily shipping requirements. This central station is equipped with

Form 3816(117) 3M 6-28

COMPARATIVE STOCK BALANCE
Based on Shortage Report Dated_____
Inventory

Part Name_____ No._____

Used_____

Received (CP116) _____

Received not posted _____

_____

Total Receipts_____

Disbursed

Service _____

Oshawa _____

Vendor rejects _____

Scrap & Misc _____

Production _____

_____

Total Disbursements _____

Record Balance _____

Shop Balance _____

Difference _____

If comparison is based on Shortage report plant is to furnish inventory of this part within 24 hour. If based on Inventory CP23 must be written to adjust difference.

Signed_____

STOCK ADJUSTMENT RECORD

MAX. ADJ. ALLOWED

CONSISTS OF FOLLOWING PARTS

DATE	SCRAP	MISC. AND EXPENSE	CUM.	DATE	SCRAP	MISC. AND EXPENSE	CUM.	DATE	SCRAP	MISC. AND EXPENSE	CUM.

MATERIAL CONTROL RECORD

MATERIAL

MODEL
GROUP NO.
QUANT.

SHRINKAGE % MAX. ADJ. ALLOWED

YEAR	REQUIREMENTS											PURCHASE REQUISITIONS				SCHEDULE			
DATE	REF.	UNITS	CA.	QUANTITY	PROD. TOTAL	SERVICE	DEFECTS	VEN.	GROSS TOTAL			DATE	REQ. NO.	QUANTITY	GROSS TOTAL	PERIOD	SCHED.	PERIOD	SCHED.

RECEIPTS

DATE	DAILY FWD.	CUM.	DAILY FWD.	CUM.
1				
2				
3				
4				
5				
6				
7				

DELIVERY SCHEDULE

SCHEDULE - IN PLANT____DAYS - IN TRANSIT____

DATE LAST REQ. AMT. DUE

MONTH	REQUIRED	IN TRAN.	BAL. TO SHIP	DELIVERY SPECIFICATIONS

DATE LAST REQ. AMT. DUE

MONTH	REQUIRED	IN TRAN.	BAL. TO SHIP	DELIVERY SPECIFICATIONS

DATE LAST REQ. AMT. DUE

MONTH	REQUIRED	IN TRAN.	BAL. TO SHIP	DEL...

DATE LAST...

a receiving and recording telautograph and exercises complete control by contacting with 16 key stations. This arrangement provides a remarkably simple scheduling control. The operator stands by constantly and issues hourly instructions which are immediately recorded at every receiving station. By this means the sequence of every part, particularly sheet metal, major units and wheels is definitely fixed from the first hour right through every hour of the day.

Using Form 4, this department builds up the hourly car-building schedule (Form 5) with the total daily requirements broken down so as to provide first, a regular hourly flow on the assembly line, and, second, a sequence of body styles to provide the shipping department with carload lot combinations. The average hourly requirement is of course based upon the number of working hours per day previously determined by the management.

Obviously, the shop control department must have an accurate picture of the movement of major units. Accordingly, every morning, detailed reports are given concerning the inventory of bodies, engines, axles and completely finished wheels and sheet metal parts. This is immediately checked against the schedule for that day to make sure that it can be met. If the schedule is upset for some reason, such as an unavoidable delivery delay, or unusual rejections, the scheduling department consults with the sales department about the desirability of using available material so as to maintain an average load on the assembly line. This is done if it is at all practicable and a readjustment is made in the succeeding schedules to make up for discrepancies.

Changes in schedule of course have to be met and the organization is flexible enough to take care of any contingency within reason. Necessarily an increase in requirements depends upon the productive capacity of the plant. Moreover, if immediate increases in shipping requirements are found necessary, acceptance depends entirely upon the available "bank" of bodies. When the body banks control the situation, increased schedules

Form 7—Shortage report for stock parts + + + + + +

Form 8—Running check is made against actual scrap + + +

Form 9—Master material control record, which gives planning department running history of requirements + + + + +

Form 10—Card record used as a final check on delivery of incoming material against each part + +

must be delayed until the necessary bodies are provided.

The foregoing gives a concise picture of the manner in which the planning function operates. Let us now consider the equally important function of material control which has been segregated only to simplify this study. Materials control operates concurrently with the other functions and production is entirely dependent upon the maintenance of a smooth flow of raw materials into the plant and prompt delivery of these materials to the manufacturing departments.

Outside Orders Scheduled

Under the setup just described, commitments for materials from outside sources are made on a 90-day basis, the purchasing schedule being taken off directly from the master car-building schedule, Form 2. Approximately 2500 purchased parts must be provided and they are listed in detail on the purchase requisition (Form 6) which is sent to the purchasing department by the planning department. As soon as Form 6 goes into circulation the purchasing department assumes the responsibility for ordering materials and following them through to the receiving dock, according to a given schedule.

Purchased material must be watched very carefully because at Oakland, as in many other plants, there are no central stores departments. Inventory is held down to an absolute minimum, the only visible stock being small "banks" in each manufacturing department to cover gap contingencies. Closely fitting this program, no perpetual inventory records are kept of the movement of stock in the plant. Careful study convinced them of the wisdom of this move, inasmuch as inventory records did not justify the expense required to keep them going. In fact the inventory record is absolutely valueless unless it is kept up to date every day and, obviously, this would entail a tremendous amount of clerical work.

Simple Stock Inventory

A simple way of keeping track of stock conditions is provided by the comparative stock balance report, Form 7, which is built up by a checker whenever the stock of any parts seems to be going below normal. Another running check is by the stock adjustment record, Form 8, which keeps track of scrap. Wherever actual scrap exceeds the maximum allowance which was figured in the original purchasing schedule, an adjustment is made in the purchasing department schedules to take care of discrepancies.

Finally, we have the master material control records, Form 9, which give the planning department a running history of current requirements for each part and a record of releases to the purchasing department.

To speed the work of the material control division, they have found it expedient to install an addressing machine. With this machine one man can write a complete set of requisitions for the entire schedule within about four hours; it used to take ten days to do the same job. Now the department is organized so that all requisitions to the purchasing department and all schedules to department heads and foremen can be delivered within 48 hours from the time the master car building schedule is set up.

Just as soon as the material is received in the plant, the materials control department assumes the responsibility for controlling its movements in the plant. For convenience the plant has been divided into zones and a certain amount of space set aside in each zone for storing the incoming material. A checker is assigned to each zone with entire responsibility for stock movements there. His function is to see that the line is stocked at all times; to report shortages; to see that the stock is kept in orderly condition, and to make sure that no stock is left in his zone unless it is scheduled for delivery there.

As a final check on the delivery of incoming materials against each part, a card record, Form 10, is set up to keep a running account of all material movements.

With this background we are better able to visualize the clear-cut operation of each part of the complex mechanism which comprises the planning organization. Now we can see the smooth coordination of this system starting with the careful, initial planning and going through the various stages of scheduling to the manufacturing departments, instructions to the purchasing department and instructions to the shop scheduling station. After the preparatory stages, we can see the scene shift to the shop scheduling section where the synchronization of all feeder assemblies and the movement on the assembly lines are effected. As in all other phases of manufacturing activity, the human equation plays a most important part. For, the maintenance of all these schedules depends upon the cooperation of the foremen and superintendents in organizing the flow of production in their departments to synchronize with the activity throughout the entire plant.

Twin Coach Rearranges Entrance and Exit Plans

TWIN COACH CORPORATION, Kent, Ohio, which introduced a smaller capacity Twin Coach at the A.E.R.A. Show in Atlantic City about a year ago, has rearranged the entrance and exit facilities so that passengers can circulate through the coach in one direction, a feature that is characteristic of the large Twin Coach. In the original smaller coach there was a single wide door directly behind the right front wheel. In the new design there are two doors, forward of the front and back of the rear wheel respectively.

A BRITISH engineer has built a Diesel-engine equipped light car, apparently for starting production. It has a single-cylinder C.L.M. two-stroke engine of 8 hp. at 1000 r.p.m. and gives the car a maximum speed of 20-25 m.p.h. The chief advantage, of course, is the low fuel cost, which is estimated at one-fifth cent per mile.

Heightened Insular Competition for American Cars Seen in British Plans

Stronger effort to get larger share of the light-six business by building cheaper models a feature of new model offerings this year

By Herbert Hosking

ADDITIONS to the number of cars in a given range and substantial price reductions are prominent features in announcements of 1931 policy by a dozen British manufacturers of passenger automobiles. Heightened Insular competition for American manufacturers is foreseen as a result, with a possibility of stronger competition in overseas markets, particularly in the British dominions and colonies.

British manufacturers who have made announcements concerning their 1931 plans during the past month are: Standard, Triumph, Alvis, Morris, Austin, Rover, Wolseley, A. J. S., Humber, Singer, Fiat (England), Citroen (England) and Daimler.

Salient trends in the new announcements, in addition to those outlined above, are apparent. Two or three British manufacturers are planning a strong effort to get a larger share of the light-six business by building cheaper models in this category than have been offered before, and other manufacturers have combined the characteristics of two models in a single refined offering which is designed to give the mechanical appeal of the higher priced component with the price appeal of the lower.

Merchandising Efforts

These merchandising efforts are of particular interest in view of the avowed purposes of the Society of British Motor Manufacturers and Traders to spend a considerable sum in promoting institutionally the sale of British cars overseas. This movement has apparently been delayed in its execution if the fact that the recent Canadian National Motor Show numbered no overseas cars among its exhibits may be taken as an example.

Recent newspaper reports in this country stated that three British manufacturers, Humber, Hillman and Commer, had initiated a combined movement for the promotion of overseas sales of the respective cars. Correspondence from M. W. Bourdon, British correspondent of *Automotive Industries* indicates that the genesis of these reports was a sales agents meeting held at Coventry by the Humber organization, but that the only topic of discussion at the meeting was the new Humber car.

Many of this year's British model announcements are being made earlier in the season than they were last year. An outline of what significant changes may be expected from the announcements already made follows:

Humber will have models in three ranges with the lowest priced body in each at £395, £455 and £695 respectively.

Fiat (England) is offering models in four ranges with price reductions of £5 to £50.

Citroen has reduced prices on the last two models introduced; a 2½ litre six cylinder, and a four which closely resembles the six. The four-cylinder model has been reduced from £255 for the saloon to £185. The six-cylinder saloon model is now priced at £235 in place of £298.

Singer has introduced a new 10 hp., four-cylinder car, with the saloon and coupe priced at £210. This model is interspersed between the Singer junior, of which the two seater costs £130, and the Singer Six, with the four-seated tourer at £240.

Austin recently introduced an improved version of the famous Seven. Prices on this model have been reduced in varying amounts from £7/10s to £10, placing it in the price range, with various body types, from £122/10s to £130. Other Austin models have been equipped with additional body options, and price reductions of £30 and £35 have been effected on a number of models.

Wolseley has introduced an additional line, the Viper, a six-cylinder car with price scale beginning at £285, with a saloon type body at £299.

A. J. S. (A. J. Stevens) is a newcomer on the British market, offering a 9 hp. car at £230 and more.

Alvis has altered prices on most of its offering, making slight reductions in most cases. Coachwork has been improved and minor mechanical changes effected. Offerings for 1931 begin with a tourer

(Turn to page 490, please)

JUST AMONG OURSELVES

Inaccurate Interpretation of Facts Hard to Refute

THE business world has a tough time getting facts accurately distributed and sensibly interpreted. So far flung is our industrial organization that very widespread distribution of these facts through every medium of publicity available is necessary and desirable. Trouble is that accurate facts and intelligent interpretation have a hard time keeping up with distribution of inaccurate facts or inaccurate interpretation.

We ran plump into an example of this personally last week, when we received clippings of the newspaper reports which several Detroit papers were good enough to make of a radio talk on the automotive outlook which we had broadcast from Washington. Being engaged in writing about men and things in industry, we aren't going to pretend that we weren't delighted and flattered at the space given to our modestly set forth ideas. We were.

But the boys who wrote the headlines—and they are the ones who really interpret news to most of us average newspaper readers, who only occasionally go on to read the text—gave an entirely erroneous idea of what the talk actually contained.

Misleading Sign Posts On the Reader's Road

F'RINSTANCE: We actually said that "During the next three months the automobile business will show up more favorably in comparison with its own 1929 performance than during any other quarter this year."

The *Detroit Times* saw in this the occasion for the headline—"Sees Big Car Output Starting Next Month."

The *Detroit News*, slightly more conservative, headlined—"Auto Industry Turns Upward."

The *Detroit Free Press*, closest of the three to the facts, said—"Auto Industry Expecting Gain in Final Quarter."

Now we ask you!

At that we marvel at the extremely high average of accuracy which is achieved by newspaper headline writers when the variety of subjects and the speed of composition are taken into consideration. We have quite a job keeping out errors in our specialized business publications where the editors are thoroughly familiar with the background of almost every story they handle and where pressure of time is only on rare occasions as great as it is in the newspaper office every hour of the day.

Exports Should Revive With Foreign Agriculture

THE change in character of American exports in recent years probably has much to do with the size of the drop in overseas sales brought about by the recent depression and probably will have much to do with the length of time necessary for export recovery.

There was a time when a very large proportion of American exports consisted of agricultural products and raw materials. Within the last year or so, however, nearly 50 per cent of our exports have consisted of manufactured products.

Naturally, these manufactured products have been going to the countries whose home activities are essentially agricultural, and it is just those countries which are predominately agricultural in character which have been under the greatest economic stress during recent months.

Only a few days ago we heard one of the most quoted economists in the United States voice the belief that export recovery rests almost entirely upon the speed with which these foreign agricultural countries march back to prosperity. When they do come back, he believes, our export markets—for automotive as well as other manufactured products—will rise to high levels again. It is this factor rather than the tariff, he believes, which will determine the time and speed of our export recovery.

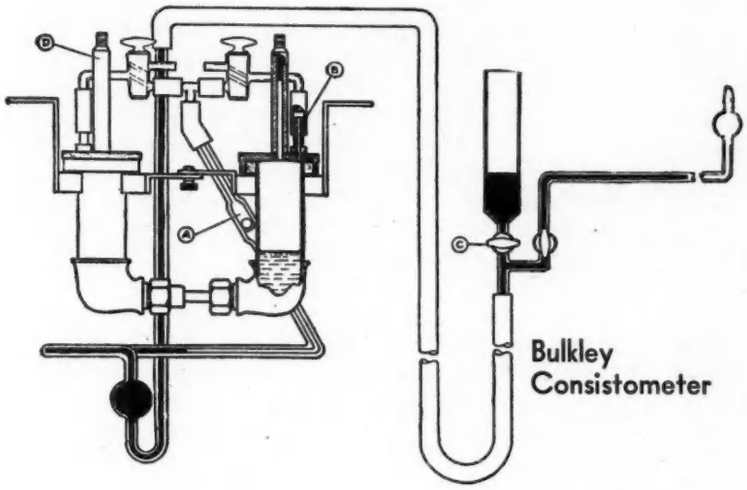
Mass Consumption Must Accompany Mass Production

RAN into some interesting figures while roaming around Washington the other day which probably do not constitute news to close students of economic movements, but which seemed to us to be rather interesting.

Since 1924, it seems American industrial production has expanded 24 per cent while European industrial production has expanded 31 per cent. Some experts see in this reason for a part of Europe's current industrial troubles. European nations, they point out, are rapidly adopting our mass production methods without having developed alongside them our potentialities for mass consumption.

Another interesting fact was that 51 per cent of European foreign trade is within Europe.

—N. G. S.



Bulkley Consistometer

Consistometer Applicable to Grease and Oil at Low Temperatures Developed

Instrument has two similarly constructed reservoirs to contain test material, joined at the bottom by capillary through which flow is to be measured, and fitted with screw covers having outlets for pressure connections + + + + + + + +

A NEW consistometer applicable to greases and to oils at low temperatures has been developed at the Bureau of Standards and is described in Research Paper No. 188 of the Bureau by Ronald Bulkley and F. G. Bitner. A drawing of the instrument, partly in section, is reproduced herewith. The device on the right is a mercury leveling bulb equipped with two stopcocks and with a side arm of small-bore glass tubing. Since the movement of the mercury surface in this tubing shows the volume of flow of the test material, the volume of mercury per unit length of the tube must be determined. If clean mercury is employed and if the pressure tubing of the system is of high-grade sulphur-free rubber, the bore of the glass side arm may safely be as great as 2.5 mm. without causing the mercury surface to assume an irregular form. This part of the apparatus is mounted on a clamp stand outside the bath. The side arm must be accurately horizontal.

The ball float valve *A* serves to prevent the passage of mercury into the consistometer in case of a sudden leak in the apparatus. It is joined to a second horizontal tube and then to a gooseneck with a safety bulb, and is connected by pressure tubing to the leveling device outside the bath. Merely to conserve space, it is bent at an angle to the horizontal tube below it. When this tube has been leveled, the frame on which the piece is mounted is clamped rigidly in position in the bath once for all. The head of mercury effective in producing flow is the vertical distance between the two horizontal tubes, and is measured on a millimeter scale attached to the bath.

The consistometer proper is made entirely of metal. It consists essentially of two similarly constructed reservoirs to contain the test material, joined at the bottom by the capillary through which the flow is to be measured, and fitted with screw covers having suitable outlets for pressure connections. The instrument is hung in the bath by side arms of brass straps. Similar straps connect the two containers at the top. The capacity of each container need not be greater than 25 cm³.

The capillaries are interchangeable. They are equipped on one end with a rigidly attached hexagonal nut and on the other with a collar and gland nut, which permits ready dismounting and reassembling of the instrument.

Each cover has two openings. The one centrally placed is closed by an ordinary automobile tire valve, while the other is joined through a 3-way stopcock to the mercury float valve.

Sufficient mercury is poured into the leveling bulb to fill the pressure system from some point on the lower horizontal tube to a corresponding point on the upper tube, as shown in the drawing. At higher pressures slightly more mercury will be required than at low pressures, on account of the expansion of the rubber tubing. This adjustment of the mercury volume is easily and quickly made through the leveling bulb in either direction as desired. Most of the mercury remains permanently in the pressure system for several months, or until fouled.

Conditions Typified

To prevent blowing air through the capillary and to reduce the total volume of air in the apparatus, slightly more of the test material should be put into the consistometer than the amount required to fill one container. Suppose the left-hand container to be more than half full and the right one to be less than half full of the material to be tested. The covers are fitted tightly, the instrument is suspended in the bath and connected to the pressure system through the flexible joints *B*. When all is in readiness for a run, both cocks of the leveling device being open, the 3-way cocks above the float valve *A* are turned into such position as to connect both containers of the instrument with *A*. The leveling device is raised sufficiently to give a head of mercury equivalent to the highest pressure desired in the run. By a tire pump, pressure is now applied through either of the tire valves *D*. There will be no appreciable flow of the test material during this procedure, since the air pressure will be equal in both containers, but the mercury in *A* will be forced out and up into the leveling device. When the pressure is just great enough to keep the mercury surfaces in the two horizontal tubes, stopcock *C* is closed. Flow of the test material through the capillary is started by relieving the pressure in the right-hand container of the instrument by connecting this container to the atmosphere through its 3-way stopcock. The test material flows through the capillary of the consistometer from left to right. As flow proceeds the mercury surface in the lower horizontal tube of the pressure system moves to the right, that in the upper tube to the left. Conditions at this instant are depicted in the drawing on the preceding page.

Since the two horizontal tubes are approximately 2.5 mm. in diameter, no correction for the surface tension of the mrecury is required. The slight pressure resulting from the difference of level of the test material in the two containers may be neglected except in the work of calibration and in such instances as demand the highest mechanical accuracy.

The volume of flow of test material is equal to the volume of mercury displaced after the run has commenced. The rate of flow is therefore calculated by timing the motion of the upper mercury surface along a scale mounted behind the side arm. The volume of flow for one point on the flow-pressure graph need not be greater than 0.5 cm.^{3} to procure ample accuracy of measurement. After the time reading has been taken the run is allowed to proceed while the head is being measured and while the data are being recorded. To obtain a reading at a second pressure, it is not necessary to use the pump again or to disturb the setting of the stopcock. The leveling bulb is simply lowered to such a position that the mercury surfaces are again in the proper portions of the horizontal tubes, when the frame is again clamped into position and the rate of flow again timed.

By this procedure, data for a great many points are obtained very speedily. If the air pressure in the system is partially relieved between runs by manipulating one of the 3-way stopcocks, greater decrements of pressure result. This method of operation is, perhaps, preferable to the first, since a much greater range of pressures may be covered in a given length of time.

Data for the first flow-pressure relation having been obtained, those for any number of others at the same temperature or at other temperatures may be obtained by forcing the material back and forth through the capillary, taking readings as the material flows in either direction.

More Competition Seen In British Insular Plans

(Continued from page 487)

priced at £162. Alvis offers a sliding roof option on any model for an additional £5, which is considerably under what most other British manufacturers are asking for the same option.

Morris has introduced the Major, a 15 hp. six priced for the chassis at £160, which brings it in between the Morris Cowley (chassis price £125), and the Morris Oxford (chassis price £185). Other Morris chassis are the Minor, priced at £100, and the Isis, priced at £250.

Standard has introduced a new six, the Ensign, which is a candidate for honors as the lowest priced six on the British market. It is a 20 hp. model and offered with a number of body options.

Rover has slashed the price of its 10/25 hp. model from £250 to £189 for the cheapest body type. Two new models have been introduced. One, with a two litre engine, begins its price scale at £298. A new light ten is priced at £358 and upward, and the Meteor model now begins its scale at £398.

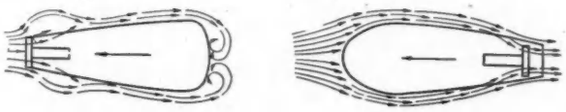
The changes and additions outlined above represent the plans of about 50 per cent of all British automobile manufacturers.

The Forum

Cooling and Stability in Car With Rear-Mounted Powerplant

Editor, AUTOMOTIVE INDUSTRIES:

WITH regard to the article that appeared in the *Automotive Industries* of July 26 concerning the rear-engined car, I want to say that I very much appreciate the frank opinion you set forward. As the designer of this vehicle, you will probably not mind if I make a few corrections, chiefly with regard to the cooling and the behavior of the car around corners. A little aerodynamics will show that the flow of air as arranged in this car is more effective than when the radiator is in the conventional place in front, for the simple reason as shown in the diagram:



You will notice that approximately 30 per cent of the air flow is lost when using a flat radiator, while owing to the partly streamlined shape of the "Sterkenburg" car, the air flow is almost constant at the point where it enters the louvers, so that almost 90 per cent of the available air passes through the engine compartment and radiator, and the radiator can actually be smaller than when placed in front. For example, you will probably remember that the German Rumpler also had a very small radiator. About ten years ago I took one of those cars through the mountains and there was no sign of overheating whatsoever. The perfect silence and roadability of this car also impressed me very much.

With regard to the suspension, the center of gravity is actually beneath the center of suspension, which will give the car a tendency to lean to the inside of the curve, although it does not actually do so, this resulting in the car being considerably more steady around corners than most cars on the road today, including those equipped with transfer springs.

JOHN TJAARDA.

Our correspondent's argument with respect to air flow is not quite clear to us. In the case of the front-mounted radiator the available amount of air per minute might be regarded as a volume equal to the area of the radiator front multiplied by the motion of the car in one minute. With the car running in low gear and a powerful fan, more than this amount of air will pass through the radiator, although at high car speeds the air flow through the radiator will generally be less than this amount, and some of the air displaced by the motion of the radiator will spill over its sides.

With the rear-mounted radiator the term "available air" is rather indefinite, as air is drawn into the engine space through the sides of the body or hood, and there is a limitless amount of air to the sides. We can, of course, again take the displacement volume obtained by multiplying the frontal area of the radiator by the movement of the car in unit time. The respective rates of air flow also depend on the relative areas of the outlet from the front engine compartment and of the inlets to the rear engine compartment, and we doubt whether reliable figures on the subject can be obtained in any way except by experiment—*Editor.*

Failure of Steel Gears Due To Fatigue, Tests Show

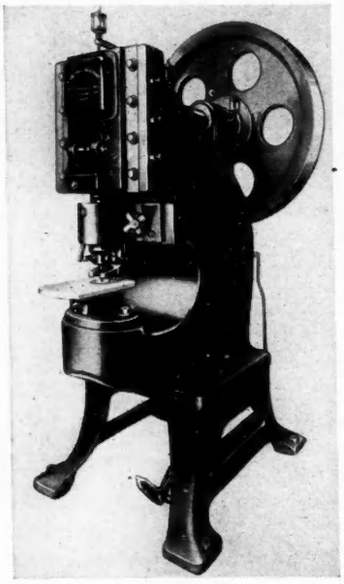
THERE has been considerable discussion in recent years as to whether the capacity of steel transmission gears as used in automotive apparatus is limited by the beam-strength of the gears or by their resistance to surface abrasion. Evidently the answer depends to some extent on the character of the material employed. Some experiments along this line have been made in England by J. H. Hyde, of the National Physical Laboratory, with gears made of air-hardening steel and having ground teeth. According to the Annual Report of the National Physical Laboratory, these experiments proved definitely that for this particular material at least neither beam strength nor resistance to surface abrasion are not the real criteria of load capacity, since the teeth invariably failed by fatigue under tooth loads much smaller than the breaking load and without serious abrasion.

This conclusion, that fatigue, rather than abrasion, is the essential factor, is confirmed by further experiments with gears running at low speeds of 125 r.p.m. under heavy tooth loads of 6000 lb. per in. of tooth width. Gears ground with a smooth semicircular curve at the root have a much greater endurance than gears with the common root fillet. Owing to its greater length, such a modified tooth has a smaller static strength, but it sustained 47,500,000 revolutions at 1500 r.p.m. with a tooth load of 1500 lb. per in. tooth width, although the average life of a standard tooth is only 8,000,000 revolutions. This observation has been made also by a number of investigators in this country.

NEW DEVELOPMENTS—AUTOMOTIVE

A. C. Campbell Nibbling Machine

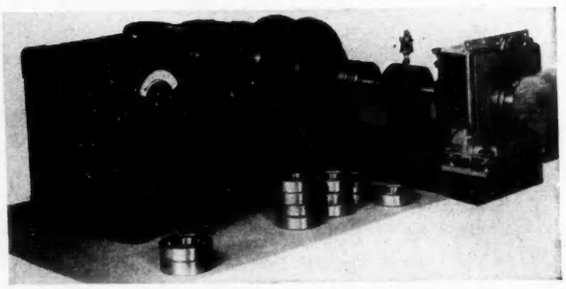
A RANGE of sheet thickness from 3/8 to 3/4 in. and three selective strokes, 1 in., 13/16 in. and 1/2 in., are provided by the No. 3 Nibbling machine recently placed on the market by A. C. Campbell, Inc., Bridgeport, Conn. This machine cuts fast in any direction — approximately 20 linear inches per minute. Like the smaller nibbling machines, it works on the circular punch and die principle, with a pilot to prevent the work from slipping and the punch taking too large bites. The cutting is said to be clean, without burr, and little finishing is necessary when an absolutely smooth edge is required.



Floor space without motor is 60 x 50 in. Net weight (belt drive), 9000 lb. Power required is 7½ hp. with the 50-in. pulley rotating at 105 r.p.m.

The Burgess Electric Bearing Tester

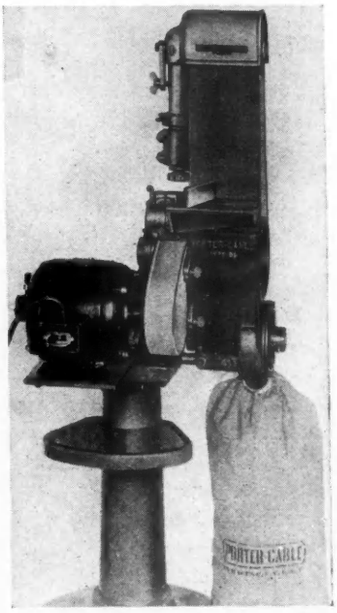
TO provide an improved and scientific method for the inspection of ball and roller bearings, the Burgess Bearing Tester has been placed on the market by the Burgess-Parr Co., Chicago, Ill. By means of this instrument bearings are said to be sorted more definitely and accurately than by the old method of listening to them. The instrument is sufficiently accurate to sort bearings into as many as five grades between excellent and defective.



This bearing tester is one of a group of acoustimeters designed to detect the amount of undesirable vibration in ball and roller bearings. These vibrations are transformed into electrical impulses, amplified so as to deflect the needle of an electrical meter. The extent of the deflection indicates the amount of undesirable vibration in the bearing under test. By means of electrical filters, only those vibrations indicative of bearing quality are amplified, thus providing an accurate method of measurement and absolute independence of outside extraneous noises.

Porter-Cable Offers Syracuse Belt Sander

TWO operating speeds and a vacuum dust collecting attachment feature the type B-9 belt sander recently placed on the market by the Porter-Cable Machine Co., Syracuse, N. Y. Moreover, this is a double-purpose machine, being adaptable for both vertical and horizontal applications.



Among the many uses of this sander are the following: burring, polishing, cleaning up castings, sharpening tools, and many others. To get the proper speed for wood or metal, the two-speed arrangement is readily adjusted by simply lifting the motor and placing the belt into the proper grooves in motor and drum pulley, with the motor weight acting as an automatic take-up on the "V" belt. Another feature is the vacuum dust collecting system which is built right in the machine. In the lower dust chute is placed a vacuum fan, driven by a small "V" belt from drum pulley. Most of the dust is carried through

PARTS, ACCESSORIES AND PRODUCTION TOOLS

this chute into a bag or conveyed elsewhere by attaching a flexible pipe.

Changing abrasive belts is quickly done without removing the guard or idler pulley. The belt tension is controlled by a spring in steel post which acts on idler pulley and automatically takes up the belt stretch. This spring tension is released by tightening knob at end of post. This machine is driven by a 1-hp. electric motor at 1725 r.p.m. Net weight of the bench type unit is 260 lb.; pedestal type, 350 lb.

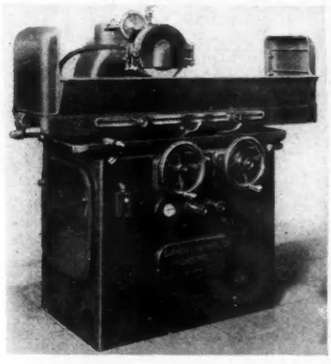
Wilson Red Processed Arc-Welding Wire

IN addition to the complete line of Wilson "Colortipt" Arc-Welding Wire, the Wilson Welder & Metals Co., Inc., North Bergen, N. J., has placed on the market a low-priced, general-purpose rod, known as Wilson Red Processed Arc-Welding Wire.

This wire combines a fast and smooth flowing quality with good penetration. It is said to produce a weld of at least 50,000 lb. per sq. in. tensile strength, and is especially recommended for general welding operations where medium ductility is required. It is supplied in 50-lb., wire-tied, burlap-wrapped bundles.

Diamond High-Speed Surface Grinder

DESIGNED for finishing such work as dies, punches, spacers, flat and formed cutters, and similar pieces, the type G, high-speed, hydraulically driven surface grinder is now offered by the Diamond Machine Co., Providence, R. I. It will grind work 7½ in. wide, 22 in. long and 9 in. high, beneath a 10-in. wheel.



Two means are provided for movement of the wheel head: the coarse feed elevating handwheel on the front of the bed, with which the wheel head may be rapidly raised or lowered, and the elevating micrometer feed handwheel, located to the left and slightly above the abrasive wheel, used for accurate vertical down feed. The elevating micrometer feed wheel is graduated on its face in tenths of thousandths.

The drive, as well as the power cross feed, is of the hydraulic cylinder and piston type, actuated by the pressure of oil pumped from the reservoir in the bottom of the bed. The cross feed may be operated manually by turning a knob which disengages the power cross feed.

Spindle speeds: single sheaves, 2000 r.p.m.; double sheaves, 2000-2500 r.p.m. Motors: spindle drive, 1½ hp., A.C. or D.C., 1800 r.p.m.; drive for oil and coolant pumps, 1 hp., A.C. or D.C., 1800 r.p.m. Floor space: maximum travel, 88¾ in.; depth, 43⅛ in.

Crescent Electric Power Lift Truck

AN intermediate type of power lift truck for use with hand truck skids is announced by the Crescent Truck Co., Lebanon, Pa. This truck has a capacity of 3500 lb. and is designed to serve requirements between the heavy-duty power truck and the hand-lift type. Two speeds forward and two reverse are provided.

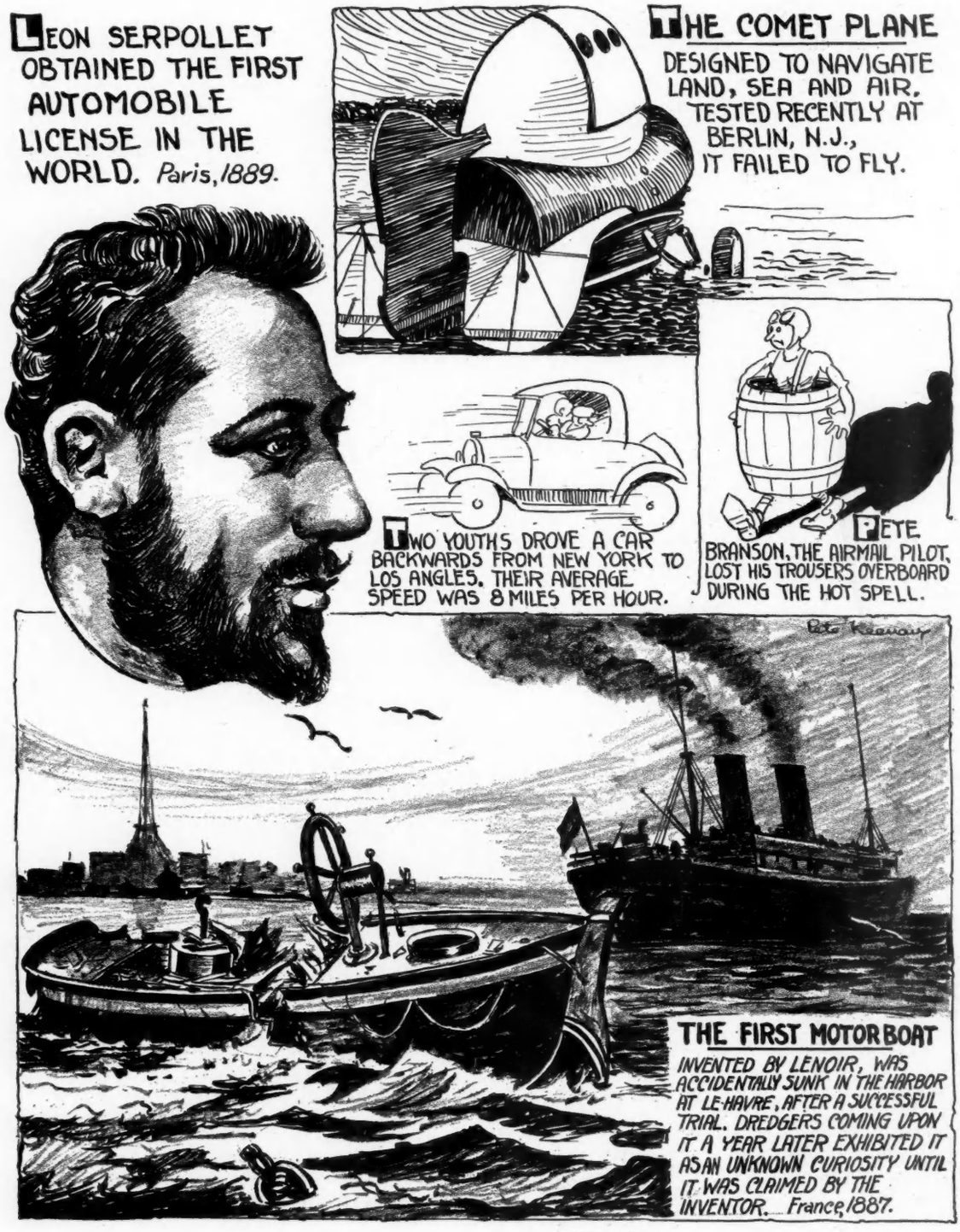
The lifting platform is 20 x 40 in.; overall length, 88 in. Turning radius, 7 ft.

G.E. Atomic Hydrogen Welding Machine

THE General Electric Co., Schenectady, N. Y., announces an automatic welder for atomic hydrogen welding. This is the first application of automatic equipment to this welding process, and was exhibited for the first time at the National Exposition in Chicago, Sept. 22 to 26.

The new welder is designed for longitudinal seam welding of all kinds. It consists of a clamping mechanism for holding the work, an automatic travel carriage, a welding head and the usual control devices and accessories. In addition, there is an auxiliary feeding device for feeding filler rod into the arc, as the tungsten electrodes used to form the arc are consumed slowly and do not contribute metal to the weld.

Automotive Oddities—By Pete Keenan



NEWS OF THE INDUSTRY

J. A. C. Warner Hails Progress in Methods

Says Automotive Industry Has Contributed Most to Production Arts

NEW YORK, Oct. 2—The automotive industry has been responsible for more progress in the art of production than any other one influence of the past quarter century, according to John A. C. Warner, general manager of the Society of Automotive Engineers, who will open its ninth national production meeting at the Book-Cadillac Hotel, Detroit, Oct. 7.

"Both in the art of cutting metals and in methods of assembly, automobile manufacturers have been setting the pace. The enforced use of special alloys possessing great strength and lightness compelled the design of new shops and new machine tools that could handle the work rapidly and accurately. Machine tool manufacturers rose to the occasion, and in cooperation with Detroit's tool designers evolved a number of machines which were almost human in their ability to perform a series of operations automatically."

Ford Sales Ratio Drop is Indicated

PHILADELPHIA, Oct. 2—A sharp drop in Ford's percentage of total passenger car registrations is indicated by figures so far available for August. Present indications are that Ford's share of total registrations amounted to about 38 per cent in August, as compared with 43.2 per cent in July and 41.66 in the first seven months of this year.

To Open Windsor Plant

WINDSOR, ONT., Oct. 2—The Canadian Battery and Nonalite Co., headed by N. L. Olson, Detroit capitalist, is to open a factory in Windsor, it was announced today by Justus Miller, secretary of the Border Chamber of Commerce. The company has been granted a charter by the Dominion Government, and installation of machinery will begin at once. More than 50 men and women will be employed at the beginning of operations.

The News Trailer

By Herbert Hosking

Wm. B. Sawyer, Sr., one-time Oakland asst. s.m., visited Wm., Jr. (now Oakland distrib. man. at Cleveland), at Worcester, Mass.; occasion—Jr.'s marriage. Sr. now assists Dunlop pres. * * * **E. W. Seaholm,** Cadillac chief-eneer, Europewarded last week on the Big Boat * * * **Mr. and Mrs. Byron C. Foy, W. P. Chrysler's** daughter and son-in-law, announce a second daughter * * * B.C.F. is v.p. of Chrysler Corp. * * * **King Carol** of Roumania and **Prince Yamashina** of Japan will receive Cord cars in about the same mail * * * **Mrs. W. Ledyard Mitchell,** wife of Chrysler Exports chrmn. brd., who crossed a double fortnight ago, sailed last week * * * **Dynamite** new sales tool—members of sales organization of G.M. Canada use slogan "We're out to be dynamiters"—"pep" served at breakfast meeting in Toronto and broadcast over CKGW * * * *Another way to boost sales* * * * loss of trucks by retreating Chinese troops resulted in placing order for 100 with American company * * * ought to be a good time for checking up on Argentine's needs that way * * * **Curtiss-wrightcorp** will name airport after late **Glenn H. Curtiss** * * * **Mulick** of Studebaker at Dallas received request for carload shipment—mailed Oct. 18, 1914—maybe the dead letter office would provide answer to slowsales. *"Build better cars to fit public purse,"* says **C. W. Nash**—this bantam car craze is certainly spreading.

John N. Willys, Am-ambassador to *Poland,* writes home often—to **L. A. Miller,** W-O pres., to ask about the boys and cars—JNW is still a large stockholder * * * **Juan de la** (Autogyro) **Cierva** cabled **Harold Pitcairn** recently congratulations on the American version of the "windmill"—**Thomas A. Edison** thinks it's a swell job too * * * A week in the life of **Henry Ford**—Sept. 22—Bought an 1888 Benz in *Munich*—Sept. 23—stepped from his hotel and found some of his party had it drawn up at the curb to take him places—attended the *Passion Play* at *Oberammergau* and feelingly gave a Model A (improved) to **Anton Lang,** the Christus—Oct. 3—book *Moving Forward* in collaboration with **S. Crowther** published by *Doubleday, Doran.*

Chrysler Closes Its German Plant

Distribution to be Handled Locally Under New Sales Arrangement

DETROIT, Oct. 2—The Chrysler assembling plant at Johannesthal, near Berlin, will be closed temporarily. Decreased business in the German market is responsible for the move. The commercial transactions and distribution of cars will be handled in the future by Hanko Industrie and Handegesellshaft, m.b.H.

An official report here states that the German field is in no way abandoned, but that the Hanko Industrie will be able to get better distribution as a distributor. The company is related in no way financially to the Chrysler Corp., being of strong individual standing in Germany.

Philanthropist Dies

Daniel Guggenheim

industrialist and humanitarian, whose benefactions to the science of aviation have been estimated in sums up to $6,000,000, died Sunday, Sept. 28, in New York. Mr. Guggenheim financed the Daniel Guggenheim Fund for the Advancement of Aeronautics, and made many other outright gifts for the promotion of aeronautical knowledge.

Men of the Industry

Oakland Shifts Three

W. A. Blees, vice-president in charge of sales of the Oakland Motor Car Co., has announced a number of major personnel changes in the home office staff. M. E. Zetterholm has been promoted from eastern sales manager to assistant general sales manager. He is succeeded as eastern sales manager by D. U. Bathrick, Great Lakes regional manager. H. E. Mahaffey will continue as western sales manager.

P. Wesley Combs, recently assistant director of the advertising section of General Motors, has been appointed advertising manager of Oakland to succeed C. S. McElwain, who has been transferred to headquarters staff of the advertising section of General Motors at Detroit.

Mr. Zetterholm joined the Oakland organization in March, 1926, as a member of the Omaha zone sales staff. He later became special representative, assistant zone manager at New York and zone manager at Pittsburgh. Previous to his present appointment he was attached, for some months, to the home office as assistant to the vice-president in charge of sales. Mr. Bathrick became Detroit zone manager for Oakland a year ago, a position he held until his appointment as Great Lakes regional manager.

Chevrolet Shifts Four

Following the announcement of the appointment of W. E. Holler, formerly Chevrolet regional sales manager at Buffalo, as assistant general sales manager of the company in charge of the eastern half of the United States, Chevrolet has made the following announcements:

D. E. Ralston continues as assistant general sales manager in charge of the western half of the country.

Mr. Holler is being succeeded at Buffalo by W. M. Packer, who becomes eastern regional sales manager after five years in the Chevrolet organization, latterly as zone sales manager at Los Angeles.

P. F. Minnock, formerly sales manager at Minneapolis, succeeds Mr. Packer at Los Angeles.

G. I. Smith leaves his post as zone sales manager at Davenport to succeed Mr. Minnock and is in turn succeeded by F. W. Phelps, formerly city sales manager at Cleveland.

Judson Leaves Continental

DETROIT, Oct. 1—The resignation of Ross W. Judson, as a director and chairman of the board of Continental Motors Corp., was accepted by the board at a meeting here yesterday. It is understood that Mr. Judson had disposed of substantially all of his holdings in Continental stock, and that for the past seven months he has had practically nothing to do with the company's affairs. The acceptance of his resignation therefore marks the termination of his relations with the company. An official of the company states that in September production schedules were increased somewhat, and several new customers, mostly in industrial fields, were added to the list of users of Continental products.

Leaders Aid Detroit

DETROIT, Oct. 2—A number of industrial leaders of Detroit met with Mayor Frank Murphy yesterday to aid in the devising of means for the alleviation of conditions in the city traceable to unemployment. Among the automotive leaders present were Dubois Young, president, Hupp Motor Car Corp.; Charles T. Fisher, vice-president, General Motors; Walter P. Chrysler, chairman of board, Chrysler Corp.; Alvan Macauley, president, Packard Motor Car Co., and Joseph B. Graham, president, Graham-Paige Motors Corp. Mayor Murphy's recently organized unemployment committee opened its centralized employment agency today with James N. Duncan, who for 12 years was chief of employment relations of Dodge Brothers, in charge.

Olberg Forms Own Company

C. K. Olberg, for many years connected with the Hale & Kilburn Co., Philadelphia, manufacturers of automobile bodies and pressed steel specialties, has entered business as manufacturers' representative under the name of Charles K. Olberg Co., with offices in the Weightman Bldg., 1524 Chestnut St., Philadelphia.

McAllister is Named

Dr. Addams S. McAllister, chief of the Division of Specification, Bureau of Standards, has been appointed assistant director in charge of commercial standardization. The appointment of Dr. McAllister was made by George K. Burgess, director of the Bureau, to fill the vacancy caused by the resignation of R. M. Hudson.

Northup Goes Abroad

Amos E. Northup, chief designer of the Murray Corp., left Saturday aboard the Leviathan for a five weeks' European trip. He will study the design trend and the achievements of foreign coach craft designers for Murray and their custom body subsidiary, Dietrich, Inc.

Contest Board to Meet

WASHINGTON, Oct. 1—The annual autumn meeting of the contest board of the American Automobile Association, will be held Oct. 13, at the Fort Shelby Hotel in Detroit.

Crossley Introduces Six-Wheel Chassis

Designed for Military or Extra Rough Travel

LONDON, Sept. 22 (*by mail*)—The Crossley Motor Co., Manchester, England, has introduced a six-wheeled passenger chassis for seven-seated bodywork. Its design is based upon its maker's experience in the production of six-wheeled chassis for trucks and military service. All four rear wheels are utilized for driving and braking; no front brakes are fitted.

To enable the front seat to be set well forward and so permit two doors at each side to be provided, the pedals are located in a "foot-compartment," alongside the engine. Legroom for the front passenger is on the other side of the engine in the same way.

The six-cylinder engine has a bore and stroke of 78 x 120 mm. and resembles that of the normal 20 hp. Crossley on a somewhat larger scale. Transmission is by a single-plate clutch and four-speed gearset, though there is an auxiliary gearset giving a low range on all four ratios and on reverse. The normal ratios are 19.6, 13.5, 8.32 and 5.2 with 19.6 to 1 reverse; the auxiliary gearset multiplies those reductions by about three. Worm steering is employed with the column almost horizontal.

This new Crossley has a road speed of about 60 m.p.h. maximum; it is intended for ordinary use on made roads as well as for cross-country runs and military staff work. It will probably find its chief demand in the latter service, though it is expected to have appeal for estate work, shooting expeditions and in the export market where roads are non-existent or bad.

Gear Makers Meet

NIAGARA FALLS, CANADA, Oct. 1—The fourteenth semi-annual meeting of the American Gear Manufacturers Association came to a close at the Hotel Clifton here today. With a registration of 75 the meeting was only slightly less well attended than previous meetings of the association in recent years. Two new features were tried out at this meeting, that of holding it during the first instead of the last half of the week, to lessen the incentive to leave before the close of the meeting, and to devote one whole day to subjects connected with accounting and cost keeping. The next annual meeting will be held in Buffalo in May next, the dates having been set tentatively as the 7, 8 and 9.

Minerva Strike Ended

WASHINGTON, Oct. 2—A strike at the plant of Minerva Automobiles, Brussels, Belgium, has been ended, but sales of the company are slow and the local automobile industry is generally in an unsatisfactory position, according to a cabled report to the Department of Commerce.

Steel Prices Spotty; Buyers Are Wary

Sheet Market Shows Keen Competition

By William Crawford Hirsch

NEW YORK, Oct. 2—Distribution of automotive orders for steel is spotty. Mills of one producing district may fare fairly well while those of another have very little business on their books. Recent reports from Buffalo picture full-finished automobile sheets as selling better than they did in the early summer while Pittsburgh and other districts single out full-finished automobile sheets as being the slowest moving among their products.

The fact that the price within recent weeks has slipped from 3.60 cents, Pittsburgh, to 3.50 cents, indicates that the market for this specialty was not so much neglected as that it continues to be subjected to keen competition. Some of the finishing mills let it be understood that the 3.50 cents quotation would not apply to business placed this month. A good deal of talk continues to be heard about automotive consumers wanting to cover their first quarter 1931 requirements at going prices and sellers being unwilling to commit themselves at these levels.

There is little doubt that automotive consumers generally look upon going steel prices as representing very nearly the irreducible minimum, and a few of the low-priced passenger car manufacturers are in a position to make a fair guess of what their operating schedules will look like in January. A considerable number of automotive buyers of steel are averse, however, to making long-range guesses as to their requirements and while they have to figure with the possibility of a firmer steel market by the end of the year, they seem to prefer running this risk to discounting the future too far in advance at the present stage.

Pig Iron—Slight improvement in demand from automotive foundries is noted. The Michigan price holds at $18. The Valley market is at $17.50 for No. 2 foundry, all merchant furnaces in that territory being out of blast. Stocks on hand continue sufficient for current melts.

Aluminum—Dullness continues to characterize the market generally. A fairly good demand for special alloys is reported, however, and prices are well maintained.

Copper—With the copper market down to 10 cents, delivered Connecticut Valley, and 10⅛ cents, delivered Michigan points, prices for copper and brass products and alloys rule easy.

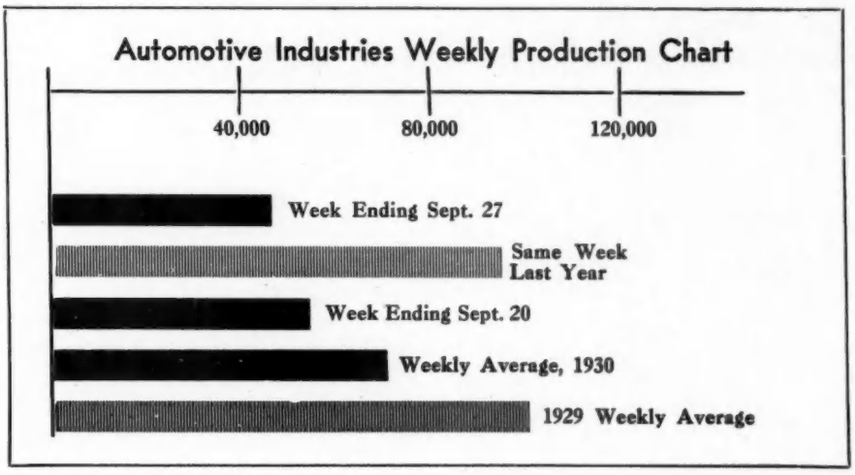
Tin—At the market's opening this week a new low for Straits tin was established—28¾ cents, consumers coming into the market forthwith to pick up bargains.

Lead—Demand is light and the market very easy.

Zinc—Quiet, with the price of 4.25 cents East St. Louis, maintained by the support of producers.

P. & W. Gets Certificate

HARTFORD, CONN., Oct. 2—Pratt and Whitney Aircraft Co. has been awarded approved type certificate No. 55 for its new geared Wasp engine, according to an announcement from the company.



Plan Giant Flying Boat

Designs for a giant flying boat, the largest yet considered in Great Britain, were completed recently, and work on the boat will be begun shortly at the plant of the Supermarine Aviation Works, Ltd., in Southampton. It will be of the high-wing monoplane type and will have a hull 100 ft. long and 18 ft. high. The boat will have a wing span of 140 ft. and the wings will have a thickness of about 6 ft.

Six Rolls-Royce Type H engines will be mounted on top of the wing, in tandem pairs, the total output of these engines being about 3700 hp. The weight of the boat complete will be about 33 tons (undoubtedly long tons).

A navigating bridge for the use of the pilots and the engineers will be provided over the passenger quarters at a height of about 12 ft. above the water line, and aft of the bridge and upper deck access to the wing and engines will be obtained.

The passenger accommodation is to be very comfortable, and will be designed for 40 persons, with sleeping berths for 20 persons, arranged in five cabins, each 14 ft. in width. In these cabins, which are to be lighted by windows, the armchair seating accommodation, with sleeping berths for night use, will be conveniently arranged. Aft of the passenger compartments will be the baggage rooms, kitchens and other compartments. The range of the new boat will most likely be 1000 miles, and she will, therefore, be available for long, continuous flights.

The machine will be of all-metal construction, and it is possible that a new method of tubular construction, similar to that employed for airship work, may be adopted for the wing.

Americans Asked to Join

PHILADELPHIA, Oct. 2—Hans Ullendorff, representative in America of the Association of Motocycle Manufacturers (Germany), has informed *Automotive Industries* that the association is not purely national in character, and is designed to include all makers of motorcycles. Three leading American motorcycle manufacturers have been invited to join the Association, according to Mr. Ullendorff. Formation of the Association of Motorcycle Manufacturers was noted in *Automotive Industries* of Sept. 27.

Sets Speed Record

DETROIT, Sept. 30—A new world's record for heavy transport planes apparently was established here yesterday when Leroy Manning, chief pilot of the Ford Motor Co., raced a new Ford high-speed trimotor plane, carrying a 2000-kilogram (4409.24 lb.) load, over a 100-kilometer (62.3 miles) closed course at a speed of 164.4319 m.p.h. The attempt at record was observed by Ray Cooper, aviation secretary of the Detroit Board of Commerce who was official observer for the Federation Aeronautique Internationale, the international ruling body at Paris. Mr. Cooper has forwarded to Paris a claim for record based upon his observations. The time for the 62.3-mile course was 22 min. 40.4 sec. The flight was made over a closed course extending from Ford Airport to a point on the outskirts of Ann Arbor, Mich., and return.

Motor Stocks Decline

NEW YORK, Oct. 1—Seven representative motor stocks showed a decline in market value of 16½ per cent during September, according to Frazier Jelke & Co., New York bankers. This decline contributed to a general decline of 100 representative stocks taken from 13 industries of 13.3 per cent.

Groups showing a greater decline than motors include amusements, which declined 29.4 per cent, electrical equipment 17.6 per cent and 17.3 per cent in mines. None of the groups listed showed an increase during the month.

Motor stocks, together with oils, mines and merchandise, were selling lower at the end of September than on the low point of the break in November, 1929.

Tire Dealers Plan Annual Convention

Woolner and Hays on Tentative Program

CHICAGO, Oct. 2—The National Tire Dealers' Association will hold its eleventh annual convention at the Hotel Sherman, Chicago, Nov. 3-6, according to an announcement from S. B. Harper, Fort Smith, Ark., president.

Subjects to be discussed at the convention include: "Changeovers," "Truck Analysis," "Truck and Bus Balloons vs. High Pressures," "Group Buying Locally," "Vulcanizing Methods" and "Prices and Collections."

Invitations to speak at the convention have been extended Samuel Woolner, Jr., president of the Rubber Manufacturers' Association; Will Hays, arbitrator of the motion picture industry, and W. K. Henderson. C. A. Meyer is managing director of the National Tire Dealers' Association, which maintains headquarters in Akron.

Seeks to Form Company

CANTON, Sept. 30—Application for incorporation under Ohio laws has been made by the Booshardt Steel Co., which plans to manufacture automobile and other steel castings under a German process. The International Steel Corp. of New York, as holding company, has signed a four-year lease for the former plant of the Canton Steel Foundry Co. The company has acquired the American rights to the steel-making processes developed by Edwin Booshardt. It is claimed that by this process steel can be made in a furnace of the open-hearth type at a higher temperature than is possible in electric furnaces. Ordinary bituminous coal is said to be used in the Booshardt process.

Overseas Club to Meet

NEW YORK, Oct. 2—The regular monthly meeting of the Overseas Automotive Club for October will be held at the Hotel Astor on Thursday, Oct. 9. The principal speaker will be James F. Hodgson, commercial attache at large of the Department of Commerce and in charge of the New York office of the Bureau of Foreign and Domestic Commerce. His topic will be "Conditions in Europe."

Chrysler Ships 15,736

DETROIT, Oct. 2—Chrysler Motors reports shipment by its divisions in September totaled 15,736, compared with 18,148 in August. Retail deliveries of Plymouth are running about 95 per cent of last year. Chrysler Motors dealers stocks on Sept. 30 were lower than same date in any of past four years.

Brief News

The Union Chain & Mfg. Co., Sandusky, Ohio, has issued a new 124-page catalog on silent and roller chains. The booklet contains engineering data in addition to describing the products of the company.

General Cable Corp. has been formed to combine the sales, manufacturing and accounting operations of 12 individual company units. Offices will be maintained at Rome, N. Y., and 420 Lexington Ave., New York City.

The Surface Combustion Co., Inc., Toledo, Ohio, has announced the purchase of the Chapman-Stein Co., a subsidiary of the Cooper Bessemer Corp. of Mt. Vernon, Ohio. Change and control were effected through an exchange of stock. The Chapman-Stein organization will be transferred to Toledo.

James W. Owens has resigned as Director of Welding of the Newport News Shipbuilding & Drydock Co. to become Director of Welding with the Welding, Engineering & Research Corp., 25 W. 43rd St., New York City.

Allen Electric & Equipment Co., Kalamazoo, Mich., will be represented in Iowa and nearby states by A. J. Johnson of Cedar Rapids. Mr. Johnson was formerly connected with the Cedar Rapids Engineering Co.

David Leckie, manufacturer of elevating die trucks, Philadelphia, announces that Haberkorn & Woods, 2208 W. Fort St., Detroit, Mich., has been appointed his agent in the Detroit territory.

The Vichek Tool Co., Cleveland, Ohio, has announced the appointment of Prof. John T. Wattleworth as assistant factory manager of the company's Cleveland plant.

The Landis Machine Co. of Canada, Ltd., Welland, Ont., has changed its name to the Canadian Landis Machine Co., Ltd.

The Independent Pneumatic Tool Co., Chicago, has announced that W. A. Nugent, manager of the St. Louis office, will be transferred to Chicago as manager of the Chicago territory. **F. J. Passino**, manager of the Pittsburgh office, will be located in St. Louis as manager. P. J. Clancy of the Cleveland office will be transferred to Pittsburgh as manager.

Gears & Forgings, Inc., has announced the concentration of all its heavy gear special machinery production at its Ford City, Pa., plant. The Pittsburgh branch office of the corporation will remain at its present location.

Manning, Maxwell & Moore, Inc., New York, has announced that Frederick M. Kreiner has been elected a vice-president of the company, continuing as treasurer, which position he has held since 1920. Mr. Kreiner has been connected with Manning, Maxwell & Moore, Inc., since 1903.

International Harvester Co. has announced that its trucks will hereafter be known simply as "International" without the word Harvester.

Kinner Airplane & Motor Corp., Glendale, Calif., has announced that an approved type certificate has been awarded to the Fairchild Mfg. Co., covering a new model Fairchild plane equipped with the Kinner 125 hp. engine.

Michigan Steel Corp. has announced that the expansion program at the Ecorse, Mich., plant of the corporation is rapidly nearing completion. All buildings have been completed and mill equipment installed.

Hercules Motor Corp., Canton, Ohio, has announced that headquarters of the Automotive Products Co., distributor of Hercules engines and power units for Great Britain and Continental Europe, exclusive of Russia, has located its offices at Brock House, Langhan St., London, W. 1, England.

Link-Belt Co., Philadelphia and Chicago, has just issued a folder No. 1248 describing their portable belt conveyor. Copies are free on request. Address 910 S. Michigan Ave., Chicago. Warren Maxwell has been appointed superintendent of its Dodge works to replace F. J. Oakes, deceased.

Fusion Welding Corp., Chicago, has published a circular describing its Weldite green surface electrodes for metallic arc welding mild steel. Circular is free upon request to 103rd St and Torrence Ave.

The United States Rubber Co. tire department has been awarded a tire contract for the buses to be used on the Detroit-Windsor tunnel under the Detroit River.

Steel Founders To Meet in N. Y.

Alloy Division Also Plans N. Y. Event

NEW YORK, Oct. 1—There will be a meeting of the Steel Founders' Society of America, Inc. at Hotel Roosevelt, New York City, on Wednesday and Thursday, Oct. 22 and 23. W. H. Worrilow, Lebanon Steel Foundry, Lebanon, Pa., vice-president and chairman of the Eastern Division of S.F.S.A., will preside.

Some of the speakers at the General Session will be: Arthur Marks, Boston, Mass., metallurgist and engineer; Clark McKercher, attorney, New York City; Harold S. Falk, Falk Corp., Milwaukee, Wis., and Frank D. Glosser, Commercial Steel Casting Co., Marion, Ohio.

There will be meetings of the Society's merchandising committee, technical research committee, board of directors and group meetings of producers of large and small steel castings. Many delegates will attend the meeting of the American Iron & Steel Institute, which will be held the following day.

The newly organized heat-corrosion resistant alloy founders' division, S.F.S.A. of which Thos. R. Heyward, Jr., of the Duraloy Co., Pittsburgh, is chairman, will hold a meeting on the 24th, at the General Offices of the Society. Uniform Cost Accounting for Alloy Foundries will be discussed by H. S. Bartholomew, cost engineer.

Production Committee to Meet in Detroit

DETROIT, Oct. 2—A meeting of the production activity committee of the Society of Automotive Engineers has been called in connection with the National Production Meeting to be held here. The committee will meet Tuesday evening, Oct. 7, at 8 p. m., in Parlor C of the ballroom floor, Book-Cadillac Hotel.

Among the matters to be discussed is listed selection of topics and authors for papers at the production session of the annual meeting of the society in January. Activities of the committee for the remainder of 1930 will also be discussed.

Buick Ships 13,303

DETROIT, Oct. 2—Buick Motor Co. reports shipment of 13,303 cars in September, compared with 20,004 in August and 26,500 in September, 1929. October schedule calls for an output of 10,995 cars.

Moon to Exhibit at Paris

ST. LOUIS, Oct. 2—The Moon Motor Car Co. will exhibit at the Paris Salon, according to an announcement from J. W. Fortune, of the Moon organization. The company has exhibited at Paris during 12 consecutive years, according to the announcement.

Tool Sales Better; Construction is Up

Inquiries Increase And Market Improves

PHILADELPHIA, Oct. 2—Improvement was found this week in orders from machine tool users, manufacturers in industrial centers reported to correspondents of *Automotive Industries*.

Although most of the activity was in other fields, a number of inquiries from automotive parts and motor vehicle manufacturers have materially brightened the outlook.

Automotive building construction showed more activity than it has during the recent lull, part of which was attributed to the usual seasonal decline and part to general business conditions.

Most of the requests reported were for single or at most but few tools, and except for a $100,000 order from a locomotive no lots have been sold during the week.

Metal working plants have projected between $2,000,000 and $3,000,000 new construction during the past week, beside a large project announced by the A. O. Smith Corp., Milwaukee.

Among the reports of proposed automotive construction reported this week were:

Abraham Slavin, architect, Bronx, New York, plans $100,000 repair and service garage building.

G. E. Haynes, architect, Pittsfield, Mass., plans $120,000 repair and service garage.

Bureau of Yards and Docks, U. S. Navy, Washington, is asking bids on erection of three large hangars for naval station, Quantico, Va.

Gulf Coast Airways, Inc., Atlanta, planning additional hangar facilities, including machine and reconditioning shops.

Buffalo (N. Y.) Common Council authorized expenditure of $100,000 for new marine airport, complete with reconditioning and machine shops.

U.S.L. Battery Corp., Niagara Falls, N. Y. (subsidiary of Electric Auto-Lite, Toledo), plans rebuilding part of factory recently destroyed by fire. Cost to be about $50,000.

Kent Automatic Parking Garage, Inc., New York, awarded contract to Donald M. Love, Inc., Philadelphia, for $2,000,000 repair and service garage building in Philadelphia.

K. Simon, Pittsburgh, (automobile bodies) has awarded contract for $50,000 factory addition.

First National Airways, Inc., Elmhurst, Ill., plans $100,000 airport with reconditioning shops, etc.

R. H. Gray (Austin, Minn.) planning $50,000 addition to truck body and top manufacturing plant.

Construction Quartermaster, U.S.A., planning call for bids for four steel hangars with equipment, Maxwell Field, Montgomery, Ala.

Southland Greyhound Lines, Inc., Houston, Tex., planning construction of reconditioning and engine repair shop. Bertram C. Hill, Dallas, Tex., is architect.

A. O. Smith Corp., Milwaukee, placed contract for $1,500,000 new equipment.

Master Tire & Rubber Co., Findlay, Ohio, has acquired controlling interest in Giant Tire & Rubber Co., same city. Company controls Cooper Corp., and Fains Rubber Co. Expansion program being developed.

Manncraft Airplane Corp., Collierville, Tenn., plans $50,000 reconditioning and shop equipment project.

Southern California Edison Co., Los Angeles, building $300,000 reconditioning and repair garage.

American Rubber Producers, Inc., Salinas, Calif., planning $150,000 construction program.

Chrysler Reduces "JC"

DETROIT, Oct. 2—Chrysler Corp. announces a reduction of $50 on the list price of the Chrysler Six Junior. The cut on all models is in line with the decrease announced on the "70" a few weeks ago.

Malcomson Joins Dodge

DETROIT, Oct. 2—George W. Malcomson, president of the Malcomson Coal Co., and son of Alexander Malcomson, early business associate of Henry Ford, has become affiliated with the truck division of Dodge Brothers, it was announced today. Mr. Malcomson retains his other business connections in going with Dodge Brothers.

Can. Goodyear Holds Up

TORONTO, Oct. 1—In statement accompanying current dividend checks, C. H. Carlisle, president and general manager of Goodyear Tire & Rubber Co. of Canada, says the annual statement for fiscal year ended Sept. 30, which will be issued shortly, will reveal that, after writing down inventories to current market value, lowest in history of the rubber industry, company will be in a position to add to surplus account. Speaking of operations, Mr. Carlisle says earnings will not be comparable to those of normal years due to condition in the industry.

"During the year the company enjoyed a larger percentage of average business and relatively has increased its position," the letter says. "However, the rapid decline in market price of both cotton and rubber and material decline in unit value and prices of finished goods have made it impossible for the company to show earnings comparable with normal years."

Deposit Alliance Stock

NEW YORK, Oct. 2—Stockholders owning 91 per cent of the outstanding Class A and common stock of Credit Alliance Corp. have deposited their stock with the New York Trust Co. in acceptance of the offer by Commercial Credit Co. to exchange its common stock for stock of Credit Alliance Corp. Exchange will be made on or before Oct. 31, 1930. Holders of the remaining 9 per cent of Credit Alliance stock may deposit their shares on or before Oct. 15, 1930, and exchange of this stock will be made on or before Nov. 15, 1930.

USL Makes "B" Batteries

NIAGARA FALLS, Oct. 2—The USL Battery Corp., Niagara Falls, N. Y., has marketed a new line of B batteries for motor car radio sets and already has been awarded a contract for them by a motor car radio set manufacturer. As compared with ordinary radio B batteries the new battery is made more robust to enable it to withstand road shocks and vibration. Waterproofness is another feature claimed.

Dodge Cuts Price On Sixes and Eights

All Models Affected By $100 Reduction

DETROIT, Oct. 2—Prices on all models of the Dodge sixes and eights have been reduced $100, bringing them to the lowest point in the history of the present series, according to an announcement from the Dodge Bros. Division of the Chrysler Corp. This brings the price on the Dodge "8" roadster to $995. New prices on other models follow:

New Dodge Prices

Six		Eight	
Roadster	$755	Roadster	$995
Phaeton	775	Phaeton	1,125
Business coupe	735	Coupe	1,025
Coupe	755	Conv. coupe	1,095
Sedan	765	Sedan	1,045
Conv. coupe	835		

Gasoline Quotations Down

CHICAGO, Oct. 1—Gasoline prices in Chicago resale market, based on the midcontinent refinery market, continue to decline. U. S. Motor gasoline is quoted 6 @ 6⅜ cents a gallon against 6 @ 6½ cents previously; 50-52 gravity 6 @ 6⅛ against 6 @ 6¼; 56-58 gravity, 5⅞ @ 6, against 5⅞ @ 6⅛; 60-62 gravity, 6¼ @ 6½ against 6⅜ @ 6⅝; 64-66 gravity, 390 end point, 6½ @ 6⅝, against 6⅝ @ 6¾; 64-66 gravity, 375 end point, 6⅝ @ 6⅞, against 6¾ @ 7, and 68-70 gravity, 7 @ 7¼ cents a gallon, against 7⅛ @ 7⅜ cents previously.

Checker Club Report

NEW YORK, Oct. 2—Consolidated income account of Checker Cab Manufacturing Corp. and subsidiaries for six months ended June 30, 1930, follows: Gross profit from sales of cabs, service and miscellaneous sales, $1,037,752; selling general and administrative expenses, $521,688; operating profit, $516,064; other income, $99,576; total income, $615,640; depreciation, $57,096; provision for bad debts, etc., $48,905; reserve for Federal taxes, $9,565; net income, $500,074.

Illinois Sales Drop

CHICAGO, Oct. 2—New car sales in Illinois for September amounted to 10,446 cars, compared with 12,113 cars for August and 19,172 cars for September, last year, according to the Illinois Chamber of Commerce. Sales in the first nine months were 148,415 cars, against 211,076 cars in the same 1929 period.

Crude Rubber Hits Bottom

NEW YORK, Oct. 2—Crude rubber trading set new low price records last week with a base of 7½ cents for October contracts, according to the F. R. Henderson Corp. Certain Eastern producers are suspending production under Government supervision, it was reported.

Exports, Imports and Reimports of the Automotive Industry for August and for Eight Months Ended August, 1930

	Month of August				Eight Months Ended August			
	1930		1929		1930		1929	
	Number	Value	Number	Value	Number	Value	Number	Value
Automobiles, parts and accessories	..	$16,996,728	..	$35,847,145	..	$217,090,084	..	$421,981,562
Electric trucks and passenger cars	7	1,515	5	5,880	30	54,247	110	162,695
Motor trucks and buses except electric (total)	5,318	3,709,306	20,706	10,059,584	64,410	43,155,668	149,870	84,071,146
Up to one ton inclusive	1,982	981,711	17,104	6,776,136	25,253	13,581,871	114,897	49,850,472
Over 1 and up to 2½ tons	2,985	2,030,014	3,319	2,594,086	35,926	22,976,433	32,153	27,932,592
Over 2½ tons	351	697,581	283	689,362	3,231	6,597,364	2,820	6,288,082
PASSENGER CARS								
Passenger cars except electric (total)	7,956	5,800,394	22,123	14,558,430	122,668	85,677,235	270,818	184,721,032
Low price range $1,000 inclusive	5,293	2,548,206	16,741	8,132,957	88,844	44,977,609	207,462	106,197,626
Medium price range 1,000 up to $2,000	2,347	2,458,544	4,874	5,184,198	29,678	30,786,342	55,935	60,657,387
High price range over $2,000	316	793,644	508	1,241,275	4,146	9,913,284	7,421	17,866,019
PARTS, ETC.								
Parts, except engines and tires	..	..	..	..	..	..	..	..
Automobile unit assemblies	..	3,684,114	..	5,699,102	..	47,256,405	..	87,619,684
Automobile parts for replacement (n.e.s.)	..	3 316,991	..	4,239,024	..	31,657,900	..	48,943,404
Automobile accessories	..	342,448	..	652,935	..	4,124,278	..	7,049,726
Automobile service appliances (n.e.s.)	..	451,784	..	695,127	..	4,704,332	..	5,279,856
Trailers	137	60,009	127	47,951	1,087	505,596	697	318,681
Airplanes, seaplanes and other aircraft	20	296,279	24	375 933	237	3,552,863	240	3,965,129
Parts of airplanes, except engines and tires	..	209,836	..	191,044	..	1,544,930	..	1,475,288
BICYCLES, ETC.								
Bicycles	173	4,881	533	13,453	2,824	75,817	3,689	94,616
Motorcycles	770	185,478	745	168,433	8,940	2,079,597	12,088	2,748,236
Parts and accessories, except tires	..	73,979	..	79,927	..	758,415	..	774,576
INTERNAL COMBUSTION ENGINES								
Stationary and Portable:								
Diesel and Semi-Diesel	21	73,995	120	97,406	211	672,003	598	812,653
Other stationary and portable:								
Not over 10 hp.	1,961	131,997	2,895	245,170	18,811	1,434,749	25,393	2,238,267
Over 10 hp.	212	..	521	206,413	3,799	2,076,518	3,210	1,594,558
Automobile engines for:								
Motor trucks and buses	38	17,228	156	38,399	19,047	1,566,295	7,410	1,009,903
Passenger cars	818	124,732	3,931	501,771	37,102	3,598,056	75,467	7,825,146
Tractors	58	19,328	52	22,287	252	100,174	601	185,011
Aircraft	25	131,154	9	36,090	253	1,116,927	237	1,029,453
Accessories and parts (carburetors)	..	255,981	..	312,371	..	2,509,369	..	3,103,581
IMPORTS								
Automobiles and chassis (dutiable)	32	79,413	60	105,989	251	414,025	433	834,613
Other vehicles and parts for them (dutiable)	..	4,444	..	316,903	..	332,281	..	1,452,441
REIMPORTS								
Automobiles (free from duty)	37	33,363	28	23,680	199	193,798	310	371,019

Show Committee to Meet

DETROIT, Oct. 2—The joint show committee for National Standard Parts Association and the Motor and Equipment Association will meet here Monday to arrange details for the joint show of the two organizations which is to be held at the Cleveland Auditorium Nov. 13-19, inclusive. The session is expected to extend into the evening and no details of business to be discussed were available for publication as this issue went to press. The joint committee consists of Robert MacFee, O. M. Anderson and L. F. Iverson, of the N.S.P.A., and Ruark, DeWitt and Seager of the M. & E. A.

Mack Has Salon Bus

NEW YORK, Oct. 1 — Mack Trucks, Inc., has introduced a new de luxe bus designated as the Salon Club Car. It is mounted on the Mack BK six-cylinder chassis and has a capacity of 23 passengers. The equipment is similar to the club lounge cars recently introduced in rail travel. Provision is made for buffet service and a radio is part of the equipment.

La France Shuts Boston Branch

BOSTON, Sept. 30—The La France-Republic Corp., Alma, Mich., has discontinued its New England branch, located in Boston.

Foreign Shipments Increase

PHILADELPHIA, Oct. 2—Despite the usual August seasonal decline in exports, passenger cars shipped abroad during August of this year showed a three per cent gain over the July, 1930, figure, and August truck exports showed a gain of 24 per cent over July.

Figures for 1929 showed August of that year off by 24 per cent as compared with July exports of passenger cars, and 22 per cent off for trucks.

Publishes Aero Cable Code

NEW YORK, Oct. 1—A new telegraphic and cable code for the use of airplane manufacturers, sales units, exporters, etc., has been compiled by the Acme Code Co., Inc., for the Aeronautical Chamber of Commerce of America, Inc. The code, which will be known as "Avico," contains over 30,000 words and phrases.

German Ford on Good Rate

BERLIN, Sept. 19 *(by mail)*—Successful operations of the Ford Motor Co. in Germany are reflected in the present production schedule of 54 cars per day, according to company officials. The peak output for the year was 96 cars a day.

Rumely Holders Advance Date

CHICAGO, Sept. 30 — The special stockholders' meeting of the Advance Rumely Co., scheduled yesterday, at which shareholders were to have been asked to accept the new Indiana general corporations act, was adjourned to Oct. 15, due to lack of quorum.

Eldredge Joins Agency

Clarence E. Eldredge, former general sales manager of Reo Motor Car Co., has joined the advertising agency of Young & Rubicam.

Chrysler Bus Sales Shifted

DETROIT, Oct. 1—Announcement has been made by the Chrysler Corp. that in future all motor coach sales with the exception of school buses will be handled by the Fargo Motors Corp., division of Chrysler. Under the new set-up Fargo will concern itself entirely with the sales of motor coaches direct to operators. A. H. Ferrandou, formerly sales manager of Dodge Brothers, in charge of motor coaches, has been appointed sales manager of Fargo. School buses will continue to be sold by Dodge Brothers through Dodge Brothers dealers. Under the new set-up all other motor coaches formerly sold by Dodge will now be handled by Fargo under the Fargo name.

Packard Shifts Model

DETROIT, Sept. 29—The convertible type sedan body which until now has only been available as an industrial custom car is being offered by the Packard Motor Car Co. as one of the regular units in its new Eighth Series Standard Eight line, mounted on the 134½ in. wheelbase chassis. The list price is $3,465 including five wire wheels.

Steel Plant in Production

DETROIT, Oct. 1 — Michigan Steel Corp. has placed in production the first unit of the new continuous process just installed at its plant at Ecorse, Mich., which will increase the production of the plant from 16,000 tons monthly to between 25,000 and 30,000 tons per month.

Airplane Sales Exceed Output

August Figures Compare July Position

NEW YORK, Oct. 1—Two hundred and forty-seven commercial and military airplanes were produced during the month of August and 273 planes were sold during the same period, according to the monthly statistical report of the Aeronautical Chamber of Commerce of America, Inc.

The copyrighted report sent to members of the Aeronautical Chamber of Commerce shows that August production and sales remained at about the July level.

Sixty-one major aircraft manufacturers reported the production of 198 commercial airplanes during August having a total value without motors of $756,604.20, an increase over July's production of 183 commercial units. Deliveries of commercial airplanes in August totaled 217 units with a value of $945,791.30 without motors.

Military airplane production in August totaled 49 units with a value of $1,054,638.90 without motors, as compared with 63 units in July. Deliveries of military airplanes on contract slightly exceeded production with a total of 57, valued at $776,000.90 without motors.

Twenty major airplane engine manufacturers reported the production of 379 commercial and military units in August, having a value of $1,718,-210.00. Deliveries during the same period exceeded production by 52 units, or a total of 431, having a value of $1,778,500. This is a substantial increase over July.

Commercial engine production totaled 155 units, while deliveries reached a total of 203 units, during August. Military engine production rose 25 per cent over July figures with a total of 224 units, valued at $1,228,000. Military engine sales closely followed production with a total output of 228 units valued at $1,244,125, an increase of 27 per cent over July of this year.

Hayes Promotes Pease

Frank W. Pease, who for the past three and one-half years has been chief draftsman of the Hayes Body Corp., Grand Rapids, Mich., has been promoted to chief engineer, according to W. W. Hoagland, president.

Mr. Pease has been in the body-building field for nearly 20 years, having begun his shop training with the Stevens Duryea Co. Following his graduation from the School for Vehicle Draftsmen and Mechanics in New York in 1916, he joined the engineering staff of the Willys-Overland Co. Later he was with the Locomobile Co. for several years and still later with Durant Motors. He was chief draftsman for LeBaron, Inc., just prior to his former association with the Hayes Body Corp.

Aluminum Use Drops

WASHINGTON, Oct. 2—Making the sharp drop of 28 per cent, the output of motor vehicle accessories and parts made of aluminum in 1929 was valued at $11,719,444 as against $16,272,132 in 1927, according to the Bureau of the Census. By quantity the 1929 production of this kind was 25,877,-354 lb.

Vauxhall Introduces New Light Six

Conforms to Present British Demand

LONDON, Sept. 30 *(by cable)*—Vauxhall Motor Co., Ltd., owned by the General Motors Corp., created a surprise in British motoring circles today by introducing an entirely new six-cylinder car, with an overhead valve engine of 125 cu. in. displacement, priced at £280 for the light four-door metal sedan, or £298 for a sliding roof sedan equipped with safety glass.

The cheapest model hitherto produced by Vauxhall was a six-cylinder, three litre chassis selling at £540.

The body on the new car is of composite construction and is made at the Luton plant of Vauxhall. Genuine hide upholstery and adjustable front seats are among its features. The chassis is of British design throughout and is the answer to an increasing public demand for a lighter six evidenced by the popularity of the Morris two-litre six introduced at about the same price last year.

The engine of the new Vauxhall develops 44 hp. at 3400 r.p.m. It is equipped with a pump fed Zenith carburetor, and has a three-speed transmission. Wheelbase is 107 in., track, 56 in. Wire wheels are standard equipment, mounting 5-in. tires.

A larger engine of 194 cu. in. displacement will be available at the same price, in an identical chassis, except for gear ratios, but will be shipped only to the export field.

Adopts Fluid Transmission

LONDON, Sept. 30 *(by cable)*—Armstrong-Siddeley has announced that it will fit the Daimler fluid flywheel on its Model 6-30, in connection with the four-speed epicyclic transmission used during the past two years. This announcement follows Daimler's adoption of the Armstrong transmission with fluid flywheel for two new models.

Armstrong-Siddeley has also announced that all its other models are to have self-changing transmission without the fluid flywheel feature, with a three or four speed gearset optional.

Checker to Buy Parmelee

NEW YORK, Sept. 29—Checker Cab Mfg. Corp. at a special stockholders' meeting last week, voted to acquire controlling interest in the Parmelee Transportation Co.

Bus Men Discuss I.C.C. Regulation

See Possible Benefit in Unified Control

CHICAGO, Sept. 29—Opinions of public benefits which would result from proposed legislation to place all bus lines under the control of the Interstate Commerce Commission and reports made on motor experiments were high spots of the fourth annual convention of the National Association of Motor Bus Operators, which closed here last Friday. The convention was attended by representatives of 100 bus lines, which carry 2,000,000 passengers over 782,000 miles of highway. Approximately 300 bus men were present.

In discussing proposed legislation, A. M. Hill, president of the association, declared that regulation by the Interstate Commerce Commission will aid the bus companies in their efforts to remove objectionable features of bus travel. This can be done, he stated, through elimination of the fly-by-night competitor. Hard rubber tires and motor gases caused the first public prejudice against the bus lines, he said, but the better companies have replaced such buses until there are now buses which offer the traveler many luxuries.

"If buses are under the control of the commission," he said, "the companies may be able to secure highways of the first grade in cooperation with the motorists. Unified control would simplify our operations and bring about a greater degree of safety by enforcing the same stringent safety precautions employed by established companies upon those who attempt competition with poorer equipment and untrained men. It would also solve our problem of taxation."

Reports to the association on experiments with alcohol and oil burning buses revealed that neither of these has reached a degree of perfection which would warrant their adoption. In England, Diesel-engined buses are being put in operation. American engineers are trying to solve the problems of noise and smoke in Diesel-engined buses, it was said. Chester Moore, chairman of the investigating committee, said that experiments will continue during the year. He predicted that oil and alcohol-burning buses will be developed to the advantage of the companies and the public.

Road Men Meet in Quebec

QUEBEC, Sept. 29—Four hundred and thirty-four delegates from eight different nations attended the 17th Convention of the Canadian Good Roads Association, recently concluded in Quebec. Of particular significance was the splendid representation from Great Britain and Newfoundland, the ancient colony having recently become a member of the association.

Gasoline Consumption in July Passed Billion Gallon Mark

NEW YORK, Sept. 29—Gasoline consumption in 42 states for the month of July, 1930, as indicated by reports made by wholesalers and dealers in the various states, under provisions of the gasoline tax laws or gasoline inspection laws, totaled 1,033,310,000 gal., compared with 949,952,000 gal. in July, 1929, an increase of 53,358,000 gal., or 5.6 per cent, according to the American Petroleum Institute.

Daily average consumption for July, 1930, was 32,365,000 gal., compared with a daily average of 30,487,000 gal. in June, 1930, an increase in daily average during July of 6.2 per cent.

Gasoline consumption in these 42 states for the seven months ending with July, 1930, amounted to 5,629,582,000 gal., compared with 5,163,245,000 gal. for the corresponding period of 1929, an increase of 466,337,000 gal., or 9 per cent.

Consumption during June and July for the states of Illinois and New York is also shown.

The figures giving the quantity of gasoline sold or offered for sale, as reported under various laws, follow. In some cases they are gross figures before deductions allowed for small quantities of gasoline reshipped or sold for other than taxable use, the tax upon which, if paid, is subsequently refunded. All figures are subject to revision.

Gasoline Consumption by States, July, 1930

	Tax Per Gal. Cents	Month of June, 1930 Gal.	Month of July, 1930 Gal.	July, 1929 Gal.	7 Months Ending With July, 1930 Gal.	7 Months Ending With July, 1929 Gal.
Alabama	4	14,772,000	15,218,000	16,702,000	100,811,000	100,208,000
Arizona	4	6,566,000	6,111,000	6,116,000	44,631,000	40,750,000
Colorado	4	15,311,000	18,542,000	15,850,000	97,593,000	88,063,000
Connecticut	2	20,965,000	23,604,000	21,872,000	124,933,000	110,083,000
Delaware	3	3,293,000	3,101,000	3,602,000	19,622,000	17,638,000
District of Columbia	2	6,998,000	7,186,000	6,596,000	44,761,000	40,603,000
Florida	6	16,249,000	16,631,000	15,468,000	137,416,000	135,867,000
Georgia	6	18,340,000	20,035,000	20,305,000	128,034,000	121,979,000
Idaho	5	5,980,000	6,615,000	6,046,000	32,886,000	27,128,000
Indiana	4	40,755,000	46,660,000	41,606,000	259,781,000	241,588,000
Iowa	3	34,957,000	40,127,000	32,804,000	222,167,000	177,954,000
Kansas	3	41,961,000	46,350,000	48,691,000	229,676,000	205,904,000
Kentucky	5	15,344,000	16,625,000	16,012,000	94,045,000	83,982,000
Louisiana	4	15,488,000	15,382,000	15,926,000	104,792,000	96,916,000
Maryland	4	16,008,000	17,075,000	16,588,000	96,760,000	89,028,000
Massachusetts	2	50,563,000	54,806,000	53,808,000	298,947,000	274,710,000
Michigan	3	74,985,000	80,015,000	81,012,000	448,345,000	434,516,000
Minnesota	3	38,261,000	43,234,000	38,566,000	220,690,000	191,045,000
Mississippi	5	(a)11,718,000	(a)12,174,000	13,261,000	(a)80,802,000	79,560,000
Missouri	2	40,018,000	42,704,000	38,260,000	246,593,000	212,873,000
Montana	5	8,778,000	8,436,000	8,243,000	46,266,000	40,534,000
Nebraska	4	19,716,000	24,029,000	21,091,000	130,958,000	132,584,000
Nevada	4	1,977,000	2,104,000	1,931,000	10,352,000	9,502,000
New Hampshire	4	6,524,000	8,153,000	7,494,000	34,057,000	29,510,000
New Jersey	2	50,031,000	56,422,000	52,826,000	304,803,000	278,112,000
New Mexico	5	4,966,000	5,181,000	4,370,000	30,308,000	24,403,000
North Carolina	5	(b)20,464,000	21,329,000	21,937,000	140,506,000	143,812,000
North Dakota	3	11,302,000	13,301,000	11,374,000	66,361,000	68,424,000
Ohio	4	89,975,000	94,767,000	90,968,000	560,569,000	525,514,000
Oklahoma	4	31,206,000	32,072,000	31,812,000	186,760,000	176,214,000
Oregon	4	16,420,000	19,362,000	17,628,000	95,817,000	87,963,000
Rhode Island	2	7,877,000	8,890,000	8,818,000	48,655,000	42,189,000
South Carolina	6	9,642,000	10,361,000	10,700,000	66,845,000	65,761,000
South Dakota	4	12,605,000	14,745,000	12,837,000	78,639,000	67,403,000
Tennessee	5	19,327,000	20,305,000	18,669,000	119,879,000	104,919,000
Utah	3½	5,857,000	6,645,000	6,071,000	35,219,000	30,968,000
Vermont	4	4,951,000	5,736,000	5,616,000	23,654,000	21,788,000
Virginia	5	20,006,000	22,010,000	20,451,000	126,085,000	112,573,000
Washington	3	24,996,000	29,721,000	24,173,000	154,745,000	139,657,000
West Virginia	4	13,232,000	14,733,000	13,996,000	75,527,000	67,070,000
Wisconsin	2	42,491,000	48,167,000	45,555,000	239,951,000	205,398,000
Wyoming	4	3,743,000	4,646,000	4,301,000	20,341,000	18,552,000
Total		914,618,000	1,003,310,000	949,952,000	5,629,582,000	5,163,245,000
Daily Average		30,487,000	32,365,000	30,644,000	26,555,000	24,355,000
Increase over previous year:						
Amount of Increase.		.....	53,358,000	.....	466,337,000	.....
Percentage increase in Daily Average..		.....	5.6%	.....	9.0%	.....
Illinois	3	87,935,000	95,694,000	.....	.....	.....
New York	2	142,510,000	154,361,000	.....	.....	.....

(a) Estimated.
(b) Revised.

N.S.P.A. Adds Members

DETROIT, Sept. 27—E. P. Chalfant, executive vice-president of the National Standard Parts Association, Detroit, has announced the election of seven manufacturers to membership in the association.

The names of the newly elected members follow: Baldwin Rubber Co., Pontiac, Mich.; Globe Machinery & Supply Co., Des Moines, Iowa; Halstead Oil Co., Inc., Cincinnati, Ohio; Park Metalware Co., Inc., Orchard Park, N. Y.; Riess Mfg. Co., Dayton, Ohio; John Taylor Battery & Supply Co., Kansas City, Mo.; X Laboratories, New York City, N. Y; Scheffer & Rossum, St. Paul, Minn.; Smith Machine Co., El Paso, Tex.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

NEW YORK, Oct. 1—Some gains were made last week in the fall trade of wholesalers and jobbers, although the prolonged warm weather was a deterrent factor. General business, however, continued below the levels a year ago. The Guaranty Trust Co.'s business index for August stood at 73.0, as against 75.9 for the preceding month and 106.3 a year ago.

INDUSTRIAL ACTIVITY

Industrial activity during August, based on the consumption of electrical energy by manufacturing plants, was 17.6 per cent below that in the corresponding period last year and 12.5 per cent below that in the corresponding period in 1928.

COMMERCIAL FAILURES

Commercial failures during August, according to R. G. Dun & Co., numbered 1913, as against 2028 in July and 1762 a year ago. Liabilities involved in the August failures totaled $49,180,653, as against $39,826,417 in the preceding month and $33,746,452 a year ago.

CAR LOADINGS

Railway freight loadings for the week ended Sept. 13 totaled 965,713 cars, which marks a decrease of 187,561 cars below those a year ago and a decrease of 172,347 cars below those two years ago.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended Sept. 27 stood at 83.1, as against 83.6 the week before.

BANK DEBITS

Bank debits to individual accounts outside of New York City for the week ended Sept. 24 were 28 per cent below those in the corresponding period last year.

STOCK MARKET

The stock market last week suffered another bad break, with extensive liquidation toward the end of that period. The volume of transactions was on a larger scale. Most issues were lower for the week, and 246 stocks registered new low levels for the year. Call money remained at 2 per cent.

BROKERS' LOANS

Brokers' loans in New York City on Sept. 24 amounted to $3,222,000,000, practically the same as a week earlier, as against $6,761,000,000 a year earlier.

FEDERAL RESERVE STATEMENT

The consolidated statement of the Federal Reserve banks for the week ended Sept. 24 showed an increase of $4,000,000 in holdings of discounted bills.

Financial Notes

Berry Motor Car Co. has declared regular quarterly dividend of 30 cents, payable Oct. 1 to holders of record Sept. 20.

General Aviation Corp. of America has declared regular quarterly dividend of 43¾ cents on preferred, payable Oct. 15 to holders of record Sept. 30.

Nash Motors Co. has declared regular quarterly dividend of $2.50 on Class A, payable Oct. 15 to holders of record Oct. 9.

American Mathis, Inc., stock was admitted to trading this week on the New York Curb Exchange. Trading activities began at the price of $16.25 per share.

A. O. Smith Corp. reports net profit for the year ended July 31 of $5,425,649, equivalent after preferred dividends to $10.66 a share on common stock and compares with earnings of $7,308,982, or $14.12 a share, for the previous year.

McCord Mfg. Co. has reported regular quarterly dividends of $1.75 on preferred and $1.75 on preferred A, both payable Oct. 1 to stock of record Sept. 25.

Gleaner Combine Harvester Corp. net profit for the 12½ months ended Aug. 31, the new close of the fiscal year, is estimated at approximately $1,400,000, after all charges and Federal taxes. This is equal to around $3.50 a share on the 400,000 shares outstanding and compares with $1,053,739 or $2.63 a share on the same number of shares in the 12½ months ended Aug. 15, 1929. The stock is on a $2 annual basis.

Auburn Automobile Co. and subsidiaries in a consolidated statement as of May 31 last showed current assets of $14,733,822 as against current liabilities of $4,473,153, a ratio of 3.3 to 1. This compares with current assets of $13,326,865 and current liabilities of $3,295,922, or a ratio of 4 to 1, on November 30, 1929.

J. D. Adams Mfg. Co. net income for eight months ended Aug. 31, 1930, has amounted to more than $720,000, after all charges, including Federal taxes, as indicated by the statement of the company, that the net for the period was in excess of annual dividend requirements of $2.40 a share on the 240,000 shares of common stock outstanding. Net income for the year ended Dec. 31, 1929, totaled $1,297,208, equal to $4.54 a share, on 60,000 shares.

The Studebaker Corp. has filed formal application to have $6,750,000 of its preferred stock and 2,031,617 shares of no par common stock listed on the board of the Chicago Board of Trade. Acceptance of the application will mark the first listing of a motor car industry stock on the board.

Sees Better Colombian Sales

NEW YORK, Sept. 29—Sales of automobiles in Colombia should pick up rapidly as soon as the present economic situation there improves, as the country has an excellent road system which is constantly maintained by American road machinery, according to Henry S. Sterling, representative of the National Automobile Chamber of Commerce, who has been traveling in South America for the past few months. While in Colombia Mr. Sterling conducted 19 meetings which were attended by 23,000 persons.

McCord Declares

NEW YORK, Sept. 30—McCord Radiator & Mfg. Co. has declared regular quarterly dividend of $1.75 on both common and Class A, respectively, payable Oct. 1 to holders of record Sept. 25.

Fokker Aircraft Declares

NEW YORK, Sept. 30—Fokker Aircraft Corp. of America has declared regular quarterly dividend of 43¾ cents on first preferred, payable Oct. 15 to holders of record Oct. 3.

Automotive Hardwoods in Demand For Some Lines, Others Hard Hit

MEMPHIS, Sept. 29—As autumn gets further along there are some changes in the hardwood belt.

The automobile industry is doing considerable buying. The body plants and auto parts concerns in this part of the South show a good degree of activity, but trade on most items at the first of the month is still rather quiet. Cottonwood has been quiet for some time on the upper grades, but there is a limited business in panel stock.

Gum shows little change and prices have not advanced much. Quartered oak is in very good demand and both white and red oak show considerable volume of movement. Ash is moving very well with prices fair, but the lower grades not so active.

Production during the last three or four months has been very much off. A good many mills are running, but not on full time. A good many are closed down. Summer logging conditions have been good and labor plentiful. The export trade is not very satisfactory on account of ocean rate questions. Manufacturers and wholesalers look to see somewhat stronger market as the autumn progresses. Dimension stock concern and hickory plants are running to a limited extent.

Production is less than 50 per cent of normal, compilations from a large number of mills show. Twenty-five to 30 per cent of the mills over the hardwood area are closed down, others are running on an average of four days a week. A very few are running to full capacity. In certain branches of the pine trade an improvement in demand is reported.

Estimates Shipping for Last Quarter

WASHINGTON, Oct. 2—Shipments of automobiles, trucks and parts in the fourth quarter of 1930 will require 112,133 cars, or 22 per cent less than the 143,718 carloads shipped in the last quarter of 1929, according to estimates of the Shippers' Regional Advisory Board, American Railway Association. Total requirements in the last quarter of the present year for the 29 principal commodities dealt with are estimated at 7,655,792 cars, a decrease of 7.3 per cent under the 8,255,912 cars required in the final quarter of last year. Among the six lines estimated to show increases in the last quarter of 1930 are petroleum and petroleum products.

N.A.C.C. Publishes Pamphlet

NEW YORK, Sept. 30—The Motor Truck Committee of the National Automobile Chamber of Commerce has just published the third of a series of pamphlets for motor truck owners, describing how the telephone system gets results in driver training. This pamphlet is one of the series being published in the educational program being promulgated by the N.A.C.C. tending to show how good truck drivers save and make money for the owners.

Steel Men to Meet

NEW YORK, Sept. 30—The American Iron and Steel Institute will hold its 38th general meeting at the Hotel Commodore on Friday, Oct. 24. The morning and afternoon sessions will take up papers on The Structures of the High Chromium Stainless Steels and Irons by E. C. Bain of the United States Steel Corp.; Some Recent Developments in the Cold Rolling of Strip Steel by Stephen Badlam, consulting engineer of Pittsburgh, and other papers dealing with problems within steel plants. There will be a banquet in the evening.

Fishers Plan New Building

DETROIT, Sept. 29—The Fisher brothers will break ground within 30 days for a 10-story office building, similar to the Fisher building, which will extend the entire block on the east side of Second Blvd., from Lothrop to Bethune Ave. This will be on the opposite side of Second Blvd., from the Fisher Building, in the next block northward.

Bureau of Standards Tests More Items

WASHINGTON, Oct. 2—Large percentage increases were made in tests of electric batteries, aircraft engines, engineering materials, hydrometers and numerous other items at the Bureau of Standards during the fiscal year 1930, as compared with 1929. There was a total increase of 27,214 in number of items tested and a corresponding increase in fee value of $139,212, according to Dr. George K. Burgess, director of the Bureau.

On Detroit Air Committee

DETROIT, Sept. 29—Mayor Frank Murphy, who took office last week, has just announced that he intends to form a permanent mayor's aviation committee to coordinate every aircraft activity and plan for the city's air future. Four men were appointed as the nucleus of the new group. They are: Harold H. Emmons, Eugene Lewis, Edward S. Evans and Harvey Campbell.

Jordan Branch Closes

BOSTON, Sept. 30—Following instructions from the factory the Boston branch of the Jordan Motor Car Co., directing sales in the New England territory, closed today.

Clydesdale to Resume Truck Production

Will Build Several Models

CLYDE, OHIO, Sept. 29—Officials of the Clydesdale Truck Co., here, announced that the factory which has been idle for a number of months will soon be started to produce a new Clydesdale truck, which will be marked both in foreign countries and in the United States. The factory at first will produce six sample trucks for export.

Starting with the first of the year it is planned to place the factory under a full schedule of production with a minimum of 125 trucks to be produced during the first three months of the year.

The new models will all be six-cylinder and will be made in 1, 1½, 2½, 3½ and 5-ton sizes.

Stewart Has New Model

BUFFALO, Sept. 29—The Stewart Motor Corporation of this city announces a new three-ton truck chassis, priced $2,950, equipped with six-cylinder motor, four-wheel brakes, nine-inch frame and full-floating rear axle spiral bevel type.

The truck type six-cylinder motor has a bore of 3¾ in. and a stroke of 4½ in., giving it a displacement of 299 cu. in. Gray iron pistons are used. The crankshaft is 2⅝ in. in diameter. The cylinders and crankcase are cast in one unit, with removable head. The four-speed transmission is standard.

Taylor Has New Plane

BRADFORD, PA., Sept. 29—A new entry in the light plane field is being announced by Taylor Brothers Aircraft Corp. The Taylor Cub, a two-place, 40-hp. monoplane, recently completed tests at the company's field in Bradford, and is now ready for production. The company announces that the plane is being offered with three optional engines, each of 40 hp., at prices ranging from $1,295 to $1,545.

Federal Has New Model

DETROIT, Sept. 29 — Federal Motor Truck Co. announces the addition of a new 2½-ton two-wheel drive six-wheel truck. This new unit, designated as Model DSW, is equipped with a 3⅞ x 4¼-in. four-cylinder Continental engine, Borg & Beck plate clutch, Warner gear, four-speed unit mounted transmission and full-floating spiral bevel Clark axle.

Quebec Registration Increase

QUEBEC CITY, Sept. 29—There are at present 172,879 automobiles in the Province of Quebec this year, official statistics show. This represents an increase of 10,347 over the number of licenses that were issued last year between Feb. 1 and Sept. 1, when 162,532 licenses were taken out by the public.

+ + CALENDAR + + OF COMING EVENTS

SHOWS

London, England, Olympia Show..October
Dallas, Southwestern Automobile, Oct. 11-26
National Roadbuilders' Show and Convention, St. Louis .....Jan. 10-16
International Garage Exposition, Berlin, Germany .....May 9-Aug. 9

CONVENTIONS

National Safety Council, Annual Safety Congress, Pittsburgh...Sept. 29-Oct. 4
Pennsylvania Automotive Association Meeting, Reading, Pa. .....Oct. 6-7
A. S. M. E. Petroleum Division Meeting, Tulsa, Okla. .....Oct. 6-8
Sixth International Road Congress, Washington, D. C. .....Oct. 6-11
Exhibition — American Roadbuilders Association, Washington, D. C., Oct. 6-11
Society of Automotive Engineers, Production, Book-Cadillac Hotel, Detroit .....Oct. 7-8
Annual Show Drawing, National Automobile Chamber of Commerce, Washington .....Oct. 9
A. S. M. E. General Meeting, French Lick Springs .....Oct. 13-15
Society of Industrial Engineers, Washington, D. C. .....Oct. 15-17
Society of Automotive Engineers, Transportation, Pittsburgh..Oct. 22-24
Motor and Equipment Association, Convention, Cleveland .....Nov. 10-14
N.S.P.A. Convention, Cleveland, Ohio, Nov. 17-21
Annual Asphalt Paving Conference, Memphis, Tenn. .....Dec. 1-5
First International Aerial Safety Congress, Paris, France .....Dec. 10-23
Society of Automotive Engineers, Annual Dinner, New York .....Jan. 8
Society of Automotive Engineers, Annual Meeting, Detroit ...Jan. 19-23
Society for Steel Treating (National Western Metal and Machinery Exposition), San Francisco..Feb. 16-20

SALONS

Chicago, Drake Hotel .....Nov. 8-15
New York, Commodore Hotel, Nov. 30-Dec. 6
Paris, France .....Oct. 2-12
Prague, Czechoslovakia .....October
Paris, France, Salon (Commercial Vehicles) .....Nov. 13-23
Brussels, Belgium, Salon .....Dec. 6-17

Wins Amateur Air Race

PHILADELPHIA, Sept. 30—Flying at considerably better than two miles a minute, Tony Little, of Overbrook, a suburb, on Sunday won the Aero Club of Pennsylvania's first air race for amateur pilots flying sport planes over a field of 17 starters. Little covered the three-cornered 78.7-mile course in his 110-hp. Warner Monosport in the net flying time of 31.01 minutes. His handicap was 2 min. and 41 sec.

To Make Piston Rings

GANANOQUE, ONT., Sept. 29—On Oct. 1 the Beaver Piston Rings, Ltd., will begin to manufacture here. Clarence C. Skinner, who recently removed to Oshawa, Ont., is president and general manager of the new company, which is capitalized at $100,000. Forty employees, exclusive of office help, will be on the payroll at the commencement.

Salon Reservations Hold Up Well

Available Space Taken for N. Y. Event

NEW YORK, Sept. 29—Exhibits already arranged for in connection with the Chicago Automobile Salon to be held at the Drake Hotel, Nov. 8-15, are within 5 per cent of the record number of last year, according to an announcement from the salon management. For the New York Salon, opening Nov. 30, all available space has been reserved.

The chassis to be exhibited at the Chicago Salon this year include the following: Cadillac, Chrysler, Cord, Cunningham, Duesenberg, Franklin, LaSalle, Lincoln, Marmon, Packard, Pierce-Arrow, Rolls-Royce and Stutz. Coachwork exhibits will be sponsored by Brewster, Brunn, Derham, Dietrich, R. H. Dietrich, Fisher, Fleetwood, Judkins, Le Baron, Locke, Murphy, Rollston, Union City, Walker, Weymann and Willoughby.

Gramm Adds 3 Models

DELPHOS, OHIO, Sept. 29—Three new models have been added to the line of Gramm Motors, Inc. Model B, a new 1¾-ton chassis, is essentially the same as the former 1½-ton unit except that some changes have been made in size of materials such as width of frame, etc. GW is the designation of the other two models, one of which is classified as a four-ton unit and the other as a gasoline tractor. Details are given in the specifications table beginning on page 65.

Hug Has New Unit

HIGHLAND, ILL., Sept. 29—The Hug Co. has brought out a new truck unit designated as Model 85-D especially designed for dirt moving and excavation service, equipped with a three-yard power hoist body. Major units include a 4 x 5¼ in. Buda engine, five-speed Brown-Lipe transmission, double-reduction rear axle and 34 x 7 pneumatic tires.

Cord Affiliates Meet

AUBURN, IND., Sept. 29 — Methods for furthering manufacturing and sales cooperation between the companies affiliated with the Cord Corp. and the Auburn Automobile Co. were under discussion here in a two-day meeting of more than 30 officials of the companies last Tuesday and Wednesday. Ten affiliated companies were represented.

Nash Adds 5000 Workers

CHICAGO, Sept. 29—More than 5000 men have been put to work in the Nash Motor Co. plants at Kenosha, Racine and Milwaukee, Wis., during the past fortnight.